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SIX NEW SPECIES OF MALLOPHAGA.

By H. E. Ewing, United States Bureau of Entomology.

Here are given the descriptions of six new species of biting lice. Eachof these species is somewhat unusual in certain anatomical structures. The descriptions are in a way preliminary ones, as further studies are contemplated.

Colpocephalum menoponoides, new species.

Head of the *Menopon* type; ocular emarginations slight; expansions of head above antennal fossae, each with transverse suture. Eyes double, corneas degenerate, pigment spot pronounced; labrum greatly reduced; ventral clypeal region without sclerite; gular area about two-thirds as broad as long, gular setae very long, six in each row, first somewhat smaller than the rest.

Thorax somewhat longer than head; prothorax with strongly developed lateral lobes, each bearing a small anterior spine and a very long posterior seta; setae in posterior transverse row of prothorax eight, long, equally spaced. Mesothorax scarcely half as big as metathorax but separated from the latter by a somewhat indistinct dorsal suture. Metathorax not as broad as first abdominal segment, with about a dozen long subequal setae in transverse row.

Abdomen broad, broadest near the middle, with all its nine segments unreduced. Tergites poorly sclerotized, each typically with two transverse rows of dorsal setae. Spiracles minute, subequal and each situated laterally in a tergite. Last segment of abdomen with a marginal fringe of equally spaced, slender setae. Abdomen with only two pairs of ventral combs, which are on the third sternite. On one side of fourth sternite in one specimen there is an incomplete comb.

Legs typical, last pair longest. Third femora each with three complete ventral combs. Claws sharp but curved chiefly near the tip.

Length of female, 1.80 mm.; width, 0.78 mm.

Type host and type locality.—From Fulica sp., National Zoological Park, Washington, District of Columbia.

Type slide.—Cat. No. 42852, U. S. N. M.

Described from three females taken from a coot, *Fulica* sp., at the National Zoological Park. This species is so decidedly *Menopon*-like that it would be placed in the genus *Menopon* but for the ventral combs.

Colpocephalum africana, new species.

Head with large, protruding, rounded temporal lobes and well developed temporal bands (occipital bands), the latter being densely pigmented at the ends. Each expansion of head over antennal fossa pigmented, scaled above and with only lateral notch. Eyes wanting. Anterior margin of clypeus with about six setae and a pair of erect peg-like spines; last seta in lateral marginal row of forehead very long, next to last short.

Thorax about as long as head; prothorax angulate laterally and with a spine at lateral apex; prothoracic marginal setae stout, twelve in number; prosternite a small tubercle; mesothorax small, about twice as broad as long, almost completely overlapped dorsally by metathorax, separated from the latter dorsally by a line. Metathorax as large as pro-, and mesothorax taken together, broadest at posterior margin and studded above with setae arranged into irregular transverse and longitudinal rows.

Abdomen long and narrow, none of its nine segments reduced; tergites fused with pleurites and studded with many small, spinelike setae, also each bearing along its posterior margin a row of large, long setae; spiracles minute, subequal, dorso-lateral. Sternite III with three combs on each side.

Rodlike basal plate of male genital armature extending forward to anterior margin of segment III; parameres greatly reduced, almost straight and not reaching the end of endomeral plate; dorsal chitinizations resembling a spearhead with two large, lateral, recurved teeth near the base at each side and two converging rows of short, sharp, recurved teeth on ventral side.

Legs well sclerotized; first coxae platelike, contiguous at their posterior ends and divergent anteriorly; claws rather weak, sharp, slightly curved.

Length of male, 2.20 mm.; width, 0.66 mm.

Type host and type locality.—Alopochen aegyptiacus, from Tana River, British East Africa.

Type (holotype).—Cat. No. 42853, U. S. N. M.

A single male specimen from type host, a goose, at type locality, August 24, 1912.

Colpocephalum echinatum, new species.

Head much broader than long; temporal lobes large, subquadrate; labrum small, not extending laterally to bases of mandibles; anteclypeus (ventral clypeal region) almost obliterated; temporal bands (occipital bands) almost interrupted but expanded and heavily pigmented at the ends; anterior margin of clypeus with six short setae, the inner pair being dark and spinelike; last seta on lateral margin of forehead stout, about equal in length to last segment of palpus, next to last seta short, spinelike; eyes wanting.

Thorax slightly longer than head; prothorax fitting into and filling up occipital emargination, strongly lobed laterally; prosternite a flattened, spinelike tubercle; mesothorax subquadrate, broader than long, so completely overlapped dorsally by metathorax as to be seen from above only as a strongly sclerotized neck uniting rest of body to prothorax; metathorax not as broad as segment I of abdomen, above sparsely clothed with setae of varying length.

Abdomen of male broad and stout; segment I longer than II; segment VIII about one and a half times as long as VII; segment IX broadly rounded both in front and behind and with about ten long setae on the posterior margin. Abdomen of female beyond segment II drawn out into a long flat cone. Tergites completely fused with pleurites, provided with but few setae except near their lateral margins; last tergite with straight converging sides and angulate posterior margin. Posterior margin of this tergite with a fringe of setae, some of which are grouped into a tuft at the apex. Each pleurite typically with a very long seta and several short ones. Spiracles minute, subequal, dorso-lateral.

Rodlike basal plate of male genital armature extending to base of abdomen; parameres straight, blunt pointed, as long as endomeral plate; dorsal chitinizations (inner chitinizations) spear-head shape, with two pairs of large, hooklike, lateral teeth, but without smaller ventral teeth.

Legs stout; first coxae platelike, remarkably developed, anterior half of each quandrangular, well sclerotized, posterior half attenuated, semi-hyaline and overlapping the mesothorax for half of the latter's length; femur of each leg of posterior pair with 4–5 ventral combs.

Length of female, 2.15 mm.; width, 0.78 mm.; length of male, 1.35 mm.; width, 0.65 mm.

Type host and type locality.—Pavo muticus from Trong, Lower Siam.

Type slide.—Cat. No. 42854, U. S. N. M.

Description based on five females and one male taken from skin of type host, obtained at type locality. Specimens collected and mounted by Dr. E. A. Chapin. Kellogg and Paine have described a *Colpocephalum*, *C. thoracicum* taken from *Pavo muticus* in Burma. Their species is of a type different from *echinatum*. In it the abdomen of the female is not drawn out so as to be cone shaped; also the pterothorax of *thoracicum* is of a shape entirely different from that of *echinatum*.

Lipeurus volsellus, new species.

Head about one and two-thirds times as long as wide; forehead broadest at posterior aspect; trabeculae short, triangular, as broad as long. Labrum much reduced, membranous area in front of labrum very large. Temples very broadly rounded, not protruding, each with a single large seta and several minute ones. Eyes degenerate; corneas not evenly rounded; ocular seta small.

Thorax about as long as head; prothorax twice as broad as long, without any large setae; mesothorax completely fused with metathorax; pterothorax twice as long as prothorax and broader than either head or first abdominal segment, with about eight posterior marginal setae.

First segment of abdomen reduced, quadrangular, not as broad as second; segments VIII and IX fused in female but separated in male; segment VIII of male with a lateral, ventral pair of long, curved, hooklike appendages, equal in length to the segment that bears them; segment IX of male formed into two conspicuous lobes that curve backward, downward and inward; fused segments

VIII and IX of female ending in a stout pair of forceps and bearing a pair of poorly developed gonapods. Each typical pleurite of abdomen articulates with pleurite in front of it by means of an inner, capitate condyle.

Genital armature of male small, degenerate; basal plate extending forward only to about the middle of seventh abdominal segment; parameres minute, im-

movable, vestigal; endomeral sclerotization diamond-shape.

Legs rather long, last pair much the longest; each tibia of each pair of legs provided with an enlarged distal spine that is used to appose tarsal claws. First coxae contiguous, last coxae broadly separated.

Length of male, 1.90 mm.; width, 0.41 mm.; length of female, 2.25 mm.; width, 0.60 mm.

Type host and type locality.—Aramides cajaneus chiricote from Gatun, Canal Zone, Panama.

Type (holotype).—Cat. No. 42855, U. S. N. M.

Described from a male and female. Female from type host and type locality, May 4, 1911, by Biological Survey; male (straggler) from a quail, Canal Zone, Panama, by Biological Survey. An unusual species, particularly on account of the reduction in size of the first segment of the abdomen, and in the shape of last abdominal segment.

Trichodectes brachycephalus, new species.

Head much flattened, being almost twice as broad as long. Forehead reduced, triangular, sides about straight; trabeculae fixed, medium, tuberclelike; ventral cephalic groove deep, narrow, flanked by a pair of recurved, hooklike tubercles. Fronto-clypeal apodomes situated about midway between the trabeculae and apex of head, each continued dorsally and posteriorly into a free, projecting spinelike tubercle. True eyes wanting, each eye being represented by a corrugated tubercle; ocular seta wanting. Antennae of male large; first segment much enlarged, about as long as other two taken together; last segment somewhat uncinate and terminating in two short, stout, sharp spines.

Thorax broad and short; prothorax about twice as broad as long but not as broad as head; mesothorax completely fused with metathorax; pterothorax about four times as broad as long, expanded laterally into winglike lobes, and bearing a posterior, submarginal row of about six, subequal, dorsal setae; sternal

plates wanting.

Abdomen short and broad, being the broadest part of the body. Pleural plates well developed and all present. Spiracles subequal, very large, situated in pleural plates. Segments VIII and IX fused in male; sternite of VIII forming the large genital plate which is about half as long as abdomen and three-fourths as broad as long.

Genital plate of male genital armature represented by two divergent rods; parameres large, flat, somewhat platelike, slightly curved and each terminating in a small knob; endomeral plate represented by two large semi-circular strips of chitin that unite to produce the pseudopenis; pseudopenis extending almost to tips of parameres and ending in a trefoil.

Legs short; coxae close together, third pair contiguous; trochanters and tarsi very short.

Length of male, 1.15 mm.; width, 0.76 mm.

Type host and type locality.—Nycticebus coucang, from Johor Lama, Malay Peninsula.

Type.—Cat. No. 42856, U. S. N. M.

Described from a male specimen taken from a skin (U. S. N. M. 114151) of the type host, a flying lemur. This species is unusual in having such a large genital plate and in the extreme width relative to length of the pterothorax.

Trichodectes abnormis, new species.

Head somewhat asymmetrical, the right lateral margin of forehead being very broadly rounded, almost straight; while the left lateral margin is produced into more or less of an angle at the base of the marginal thickening of ventral cephalic groove. Temporal lobes rounded, not protruding; eyes reduced, without pigment, ocular seta about twice as long as diameter of eye; trabeculae very large, as broad as long, not reaching the end of first antennal segment; fronto-clypeal apodeme at the base of trabeculae, not showing line of closure.

Thorax much shorter than the head but equal in width to the latter; prothorax about three times as broad as long, but not as broad as the pterothorax; prothoracic spiracles very large, in diameter equal to about one-half the length of prothorax, situated ventrally in pleural regions. Pterothorax with very short, strongly divergent sides and broadly rounded, outwardly curved posterior margin.

Abdomen stout, broadest at third segment; pleurites all present but poorly sclerotized; spiracles wanting; eighth abdominal segment almost as broad as long, subcylindrical; ninth segment very small, broader than long, cone-shape.

Basal plate of male genital armature with lateral margins thickened; parameres very unusual, each being a straight rodlike structure arising proximal to endormeral plate and extending along side of its fellow to tip of eighth abdominal segment; endomeral plate represented by a crescent of chitin, hinged at each end to the thickened margin of the basal plate.

Coxae ventral, anterior pair almost contiguous, second pair farthest apart; leg I short, with tibia bearing a stout distal spine functioning as a thumb.

Length of male, 1.10 mm.; width, 0.50 mm.

Type host and type locality.—Lemur rufus from east coast of Madagascar.

Type (holotype).—Cat. No. 42879, U. S. N. M.

A single male from skin (U. S. N. M. 63338) of type host, taken at type locality, June 12, 1895. An unusual species in several respects. The asymmetry of the head is not pronounced and possibly may be due to individual variation.

THE DISCOVERY OF WHAT IS POSSIBLY THE LARVA OF AN INTRODUCED TENEBRIONID, LEICHENUM VARIEGATUM KÜST.

By R. A. St. George, Bureau of Entomology, United States Department of Agriculture.

In a recent study of the larvae of the Tenebrionid sub-family Opatrine, as represented in the U. S. National Museum collection, an undetermined specimen was found which appears to be of considerable taxonomic interest. An examination of the characters of this larva revealed its relationship to the Opatrinae. In the collection only one North American genus, Ephalus, and species, latimanus Lec., are represented in this subfamily. Two larvae and an adult of this latter species were taken at Wareham, Massachusetts, by S. Henshaw in May, 1895.

The foregoing undetermined specimen differed from the larvae of *Ephalus* sufficiently to indicate that it belonged to another genus. This specimen was collected around the roots of Bermuda grass that was found along the shore of Mobile Bay in

Alabama.

An examination of Leng's catalogue to determine the distribution of other forms in this subfamily indicated that none of the genera of the tribe Opatrumini, to which *Ephalus* belongs, were indigenous to the Gulf-Coast region and only one genus in the remaining tribe Leichenini. This genus, *Leichenum*, possesses the single species *L. variegatum* Küst. It is a species introduced from Madagascar and the only locality from which it is known in this country, according to Leng, is Alabama.

In view of this it seemed to the writer that this larva might quite possibly be that of *Leichenum variegatum* and that it could easily have become established either by adults escaping while goods were being unloaded from a ship, or through the dropping or throwing out of infested material which contained nearly mature larvae, the latter completing their development and then becoming associated with the roots of the Bermuda grass. The specimen was collected by Mr. H. P. Loding along the bay shore. The date of collection was not given.

The following characters define the larvae of Opatrinae and are common to the specimen tentatively determined as Lei-

chenum variegatum Küst.:

Back of the mandible opposite the cutting edge slightly sharp, and opposite the molar part with a membranous elevation bearing anteriorly one or two setae and posteriorly as many short, thick spines, apex of both mandibles bifid with an additional dorsal tooth between apex and molar part.

Ninth abdominal segment shorter than eighth, usually wider than long, subconically produced, obtusely pointed, apex not mucronate; side margins posteriorly set with from two to eleven spines on each side, tergum otherwise without spines, paramedianly with one anterior and one posterior pair of setae; sternum with a few setae, often arranged in a transverse row.

Tenth segment with a pair of subconical, setiferous anal pseudopods, which sometimes bear two to three spines.

Clypeus usually armed with two spines and two setae, one of each on each side. In Opatrum depressum, a form from Java, there are only the two setae.

Labrum armed, the disc bearing either two spines, one on each side, or six spines, three on each side.

First article of antenna usually slightly shorter than second, except in *Phylax littoralis* Muls. (an European species), which has the first article twice as long as second.

Dorsal half of head capsule not setose but sides and ventral half sometimes slightly setose.

Ocelli arranged in a single transverse group on each side of head.

Epipharynx bearing three spine-like setae along the anterolateral margin, two hooks medianly; usually without two large teeth posteriorly, but sometimes with numerous minute ones.

Hypopharyngeal sclerite tricuspidate, with the median portion slightly produced but not bifid.

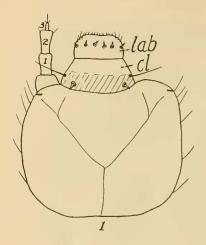
Prothoracic legs larger than the two other pairs; claw incurved, slender and tapering.

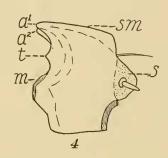
Abdominal spiracles annular, with circular mouth piece.

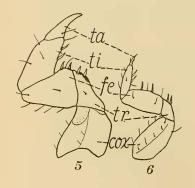
EXPLANATION OF PLATE.

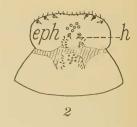
Leichenum variegatum Küst.? Details of larva. (Drawings by the author.)

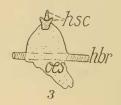
- Fig. 1. Dorsal view of head showing the clypeus (cl), labrum (lab), and articles of antenna (I, 2, 3).
- Fig. 2. Ephipharynx and anterior margin of labrum; eph, epipharynx; h, median paired hooks.
- Fig. 3. Hypopharyngeal region, portion of oesophagus and hypopharyngeal bracon; hsc, hypopharyngeal sclerite; hbr, hypopharyngeal bracon; oes, oesophagus.
- Fig. 4. Dorsal side of right mandible; a¹ and a², bicuspidate apex; t, additional dorsal tooth of cutting edge between apex (a¹) and molar part (m); sm, sharp margin on back opposite the cutting edge; s, membranous swelling on back opposite the molar part (m), bearing a seta anteriorly and a spine posteriorly.
- Figs. 5, 6. Left prothoracic and metathoracic legs, respectively, showing anterior face; cox, coxa; tr, trochanter; fe, femur; ti, tibia; ta, tarsus.
- Fig. 7. Dorsal view of eighth (VIII) and ninth (IX) abdominal ("pygidial") segments.

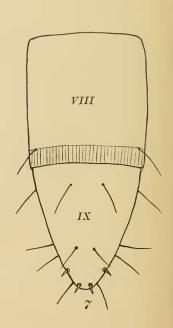












NEW WEST INDIAN BUPRESTIDAE (COLEOPTERA).

By W. S. Fisher,
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In working over the West Indian material in the family Buprestidae which has accumulated during the past year the writer found the new species herein described.

Polycesta insulana, new species.

Female.—Broadly elongate, two and three-fourths times as long as wide, broadly, equally rounded in front and behind, moderately convex above, and uniformly piecous, with a vague reddish-brown tinge on the dorsal surface.

Head flat, and feebly, transversely depressed between the antennal cavities; occiput without longitudinal carina; surface coarsely, deeply, irregularly punctate, the punctures variable in size and more or less confluent, and sparsely clothed with long, erect, inconspicuous hairs; intervals irregular in shape, convex, smooth, and shining; epistoma broad, and feebly, arcuately emarginate in front.

Pronotum strongly transverse, two times as wide as long, slightly narrower in front than behind, and widest at basal third; sides strongly obliquely expanded from apical angles to basal third, where they are obtusely angulated or rounded, then strongly narrowed to the posterior angles, which are nearly rectangular; anterior margin deeply, arcuately emarginate, with a broadly, vaguely rounded median lobe, and the margin smooth and feebly elevated; base feebly, obliquely arcuate on each side, with the median lobe broad, slightly produced, and narrowly truncate in front of scutellum; disk with a broad, angular, moderately deep median depression; surface coarsely, deeply, irregularly punctate, the punctures well separated on the median part, but becoming more or less confluent toward the sides of the pronotum, and with a few short, inconspicuous hairs arising from the punctures; intervals finely, densely granulose, and subopaque. Scutellum subquadrate, wider behind than in front, and slightly elevated.

Elytra feebly convex, and about as wide as pronotum at base; humeral angles broadly rounded; sides feebly expanded behind the humeral angles, nearly parallel to apical third, where they are slightly wider than at base, then arcuately narrowed to the tips which are conjointly broadly rounded, the lateral margins coarsely, irregularly serrate posteriorly; each elytron with five smooth, longitudinal costae including the scutellar one, which is distinct and extends nearly to middle of elytron, the two discal costae extending from base to apex of elytron, and the third costa interrupted near the humerus; there are also ten rows of deep, round punctures on each elytron, which are arranged in double rows between the costae, and the rows separated from each other by straight, longitudinal intercostae, which are subequal in height to the costae, the punctures rather uniform in size and shape, usually well separated from each other on the disk, but becoming more or less confluent toward the lateral margins; surface of costae, sutural and lateral margins sparsely, vaguely punctate, and clothed with a few very short, inconspicuous hairs.

Abdomen beneath coarsely, densely punctate, and rather densely clothed with

moderately long, semierect, cinereous hairs; intervals smooth and shining; first segment moderately convex, sparsely punctate at middle, and without a densely punctured and pubescent median spot; last segment broadly rounded at apex. Prosternum moderately convex, coarsely, densely punctate, and sparsely clothed with long, erect, inconspicuous hairs; anterior margin feebly elevated, nearly truncate at middle, and with a broad, vaguely indicated lobe on each side; prosternal process short, very broad, nearly flat, and without marginal grooves, the sides obliquely narrowed to middle of anterior coxal cavities, where they are emarginate and abruptly narrowed, then obliquely narrowed to the apex, which is broadly rounded.

Length, 21.5 mm.; width, 8 mm.

Type locality.—Bath, Jamaica.

Type.—Cat. No. 43136, U. S. National Museum.

Described from a unique female collected at the type locality

by Wirt Robinson during July, 1902.

In my table of the species of *Polycesta*¹ known from the West Indies, this species runs to No. 7, but it differs from *chevrolati* Thomson in having the punctures on the elytra round and arranged in regular rows, and the pronotum broadly and deeply depressed at the middle. According to the description of *perfecta* Kerremans, *insulana* differs from that species in coloration, and in having small, round punctures on the elytra. This species also resembles *thomae* Chevrolat, but differs from that species in having very distinct scutellar costae, the intercostae on the elytra straight, subequal in height to the costae, and the punctures between the costae are round, nearly equal in size and shape, and arranged in double rows. The writer has not examined specimens of *perfecta* Kerremans or *gossei* Waterhouse, both described from Jamaica, but *insulana* does not agree with the description given for either of these species.

Psiloptera (Lampetis) aurata var. domingoensis, new variety.

Similar in shape and structure to *aurata* Saunders, but differs from it in color. Elytra brownish black, with distinct greenish and purplish reflections when viewed in certain lights, and the lateral margins broadly reddish cupreous behind the middle. In the typical *aurata* the elytra are of a uniform aeneo-cupreous or aureo- cupreous color.

Length, 17-23 mm.; width, 6.5-9.5 mm.

Type locality.—Romana, Santo Domingo.

Type and paratype.—Cat. No. 43137, U. S. National Museum. Described from two specimens collected at the type locality during July, 1925, by H. E. Box.

¹Proc. U. S. Nat. Mus., vol. 65, No. 2522, Art. 9, 1925, p. 8.

Actenodes nobilis (Linnaeus).

Buprestis nobilis Linnaeus, Syst. Nat., 10 ed., 1758, p. 410.

A single example of this species was collected at Port-au-Prince, Haiti, during 1899, by R. J. Crew, and it is identical with specimens of this species from Brazil. This species was originally described by Linnaeus from "Indiis." It has been recorded in the literature from various parts of Mexico, Central America, and South America, but this is the first time it has been recorded from a definite locality in the West Indies.

Peronaemis elegans, new species.

Broadly agriliform, broadly rounded in front, strongly acuminate behind, glabrous, and rather strongly shining; head green, with the entire median part purplish red, margined golden yellow; pronotum purplish red, base and anterior margin narrowly green, with a large bluish green spot becoming golden yellow internally at the posterior angles; scutellum violaceous; elytra purplish or brownish red, the bases and lateral and sutural margins narrowly bluish green or violaceous, more or less margined golden yellow internally, and each elytron with a large inconspicuous purplish spot at middle, behind which is a small inconspicuous golden yellow spot; beneath bluish green, with a distinct cupreous tinge when viewed in certain lights, and the legs violaceous.

Head feebly and evenly convex, nearly flat between the eyes, with a short longitudinal carina on the occiput, and without any distinct depressions; surface coarsely, densely, deeply, regularly punctate; intervals smooth on the front, but becoming finely granulose on the occiput; epistoma wide between the antennal cavities (about four times as wide as the cavities), vaguely, broadly, arcuately emarginate in front, with the sides strongly angulated.

Pronotum strongly convex, one and one-half times as wide as long, slightly wider at base than at apex, and widest along basal half; sides arcuately expanded from apical angles to apical third, then nearly parallel to the posterior angles, which are rectangular; anterior margin with a vague, broadly rounded median lobe; base nearly transversely truncate, with a vaguely rounded median lobe; lateral margins when viewed from the side sharply defined, arcuate, and extending from base to anterior margin; surface with three large basal depressions extending to middle of pronotum, the median one broader than the lateral ones, densely and coarsely punctate, the punctures deep and irregularly distributed; intervals finely granulose toward base, and with a more or less distinct longitudinal smooth space in the median depression. Scutellum nearly twice as wide as long, obliquely narrowed anteriorly, broadly rounded posteriorly and the surface transversely depressed and finely reticulate.

Elytra slightly wider than pronotum at base; sides nearly parallel to behind the middle, where they are slightly arcuately expanded, then obliquely narrowed to the tips, which are acute, and the lateral margins finely and irregularly serrate; humeral angles rectangular; basal depressions broad, transverse, and shallow; surface more or less irregularly rugose in the basal regions, and punctate-striate, the punctures irregular in the striae, coarse in the basal regions but becoming finer toward the apices; intervals finely, densely granulose, and sparsely, irregularly punctate.

Abdomen beneath strongly convex, rather densely punctate, the punctures well separated and becoming finer toward the apex of the abdomen, and from each puncture arises a moderately long, semierect, inconspicuous hair; intervals finely, densely granulose; last segment strongly attenuate, and feebly, arcuately emarginate at apex. Prosternum very coarsely punctate, the punctures deep and well separated; anterior margin transversely truncate; prosternal process nearly flat, sides nearly parallel to behind the coxae, then obliquely narrowed to the apex, which is broadly rounded. Posterior coxae strongly concave, and the surface irregularly punctate, the punctures coarse internally but becoming finer externally.

Length, 10 mm.; width, 3.2 mm.

Type locality.—Loma del Gato Mountains, Oriente Province, Cuba.

Type.—Cat. No. 43138, U. S. National Museum.

Described from a single example (sex not determined) received from S. C. Bruner, and collected by Brother Hermano Norberto, of La Salle College, Havana, at the type locality during July, 1925, at an elevation of approximately 900 meters.

This is the second species to be described in the genus *Peronaemis*, and it differs from the genotype, *thoracicus*, described by Waterhouse from Jamaica, in coloration, and in having the sides of the pronotum nearly parallel along the basal two-thirds, the lateral margins of the pronotum when viewed from the side sharply defined for their entire length, and the elytra more rugose and more strongly punctured.

Neotrachys hoffmani, new species.

Rather broadly elongate, moderately convex, broadly rounded in front, more narrowly rounded posteriorly, slightly narrower behind than in front, glabrous, subopaque, and uniformly dark bronzy green above; beneath piceous, with a vague aeneous tinge.

Head broad, nearly flat, feebly, longitudinally depressed on the front, broadly, deeply, transversely depressed behind the epistoma, and with a deep postoral pore on each side situated at the margin of the antennal cavity; surface finely, densely granulose, and coarsely, irregularly punctate, the punctures shallow, well separated, and becoming obsolete toward the epistoma; epistoma wide between the antennal cavities (about three times as wide as the cavities), and the anterior margin broadly, deeply emarginate, and strongly elevated; antennae short and uniformly piceous.

Pronotum feebly convex, nearly two and one-half times as wide as long at middle, distinctly narrower in front than behind, and widest at base; sides arcuately narrowed from base to anterior angles, and narrowly margined; anterior angles obtuse; posterior angles nearly rectangular and feebly projecting; anterior margin broadly, arcuately emarginate, with the median lobe only

vaguely indicated; base transversely truncate to near middle of each elytron where it is arcuately sinuate, then turning obliquely backward to the scutellum, in front of which it is broadly rounded; surface feebly, broadly depressed along the lateral margins, and the base toward posterior angles finely, densely granulose, and coarsely, sparsely, and irregularly punctate. Scutellum very small and triangular.

Elytra moderately convex, and distinctly wider than pronotum at base; humeral angles broadly rounded; sides nearly parallel to behind middle, then arcuately narrowed to the tips, which are conjointly broadly rounded, with the lateral margins entire; each elytron with a broad, shallow depression along lateral margin, the depression interrupted at the middle by a broad elevation, but without a distinct basal depression; surface somewhat uneven, vaguely rugose, without lateral carinae, and rather densely, coarsely, irregularly punctate, the punctures shallow, and becoming more obsolete toward the apices.

Abdomen beneath coarsely, sparsely, occllate-punctate, and very sparsely clothed with short, inconspicuous hairs; intervals finely, densely granulose; last segment broadly rounded at apex. Prosternum sparsely, coarsely punctate; anterior margin broadly rounded and feebly declivous; prosternal process broad, slightly expanded behind the coxal cavities, and broadly rounded at apex.

Length, 3 mm.; width, 1.5 mm.

Type locality.—Porto Rico.

Type.—Cat. No. 43139, U. S. National Museum.

Described from a unique specimen collected by W. A. Hoffman

and labelled "Porto Rico," without any definite locality.

This species is allied to *guadeloupensis* described by Fleutiaux and Sallé, but differs from that species in being subopaque, uniformly dark bronzy green above, broadly elongate, and not so strongly narrowed posteriorly.

EIGHT NEW SPECIES OF SERPHOIDEA (HYMENOPTERA) FROM BRITISH COLUMBIA.

By OSCAR WHITTAKER.

The following species are all described from specimens taken in western British Columbia by the writer, in whose collection, except where stated otherwise, all type material remains.

CALLICERATIDAE.

CALLICERAS Nees (= Ceraphron Jurine).

Calliceras pacifica, new species.

Female.—Head and thorax black; abdomen brown, basally yellow; antennae with the scape basally brownish-yellow, apically dark brown; pedicel dark brown, apically paler; flagellum brown becoming darker towards apex, the apical three joints black; legs yellow, apex of front femora dorsally brown; apical

joints of tarsi sometimes slightly dusky; wings faintly tinged with brown, tegulae and venation brown, the radius paler. Head transverse, as wide as thorax, one and one-half times as wide as long viewed from above; eyes large, hairy, reaching the occiput which is nearly straight; ocelli in an equilateral triangle, lateral ocelli about as far apart as from the eyes and occiput; vertex and frons shagreened, the latter with a deep depression in front of anterior ocellus which extends as a deep groove to the clypeus; vertex with a groove extending from just behind the anterior ocellus to the occiput and a shallow depression external to the lateral ocelli; facial depression large and deep, smoother than vertex, very finely and somewhat transversely rugulose. Antennae with scape one-half as long as flagellum; pedicel about one and one-half times as long as joint 3; joints 4-6 equally long but becoming distinctly thicker, two-thirds as long as joint 3; joint 7 slightly longer than joint 6; joints 7-9 each slightly longer and considerably thicker than the preceding joint; joint 9 slightly thicker than long; apical joint conic-ovate, twice as long as thick and about as long as joints 3-5 combined. Pronotum very short; mesonotum and scutellum shagreened, the former with a distinct median groove; scutellum elongate, frenal grooves punctate, meeting a short distance from the posterior margin of mesonotum. Head and thorax with short, scattered, pale hairs; propodeum with the posterior angles produced; pleurae smooth. Wings with the radius long, curved. Abdomen polished, longer than the thorax, acutely pointed at the apex, the base emarginate and shortly striate; second tergite somewhat more than twice as long as rest of abdomen.

Length, 1.2-1.3 mm. Expanse, 2.1-2.3 mm.

Described from ten specimens taken at Chilliwack on various dates from April to October, 1926-7.

dates from April to October, 1926-7.

Paratypes sent to U. S. N. M. and Mr. Robert M. Fouts.

Variation.—The basal abdominal band varies a little in brightness and extent and in one example is absent.

APHANOGMUS Thomson.

Aphanogmus subapterus, new species.

Female.—Head and thorax black; scape and pedicel dull yellow, flagellar joints becoming darker from the base, distal joints dark brown; legs, except coxae, yellow; apical joint of front tarsi dusky; abdomen brownish-black. Head very nearly twice as wide as long, wider than the thorax, front and hind margins straight; eyes large, nearly reaching the occiput; ocelli conspicuous, in a triangle, the lateral ocelli about as far apart as from the eyes and further than this from occiput. Vertex regulose, with a depression before front ocellus; facial depression almost smooth. Antennae subclavate, shorter than the body; scape robust, thickest near base, four times as long as pedicel or about as long as pedicel and joints 3–5 combined; joint 3 slightly longer than pedicel; joints 4 and 5 slightly shorter than pedicel; joints 7 and 8 equal in length to pedicel; joint 9 equal to joint 3, as thick as long; apical joint very nearly twice as long as preceding joint, conic-ovate; basal joints of flagellum basally narrowed, subpedunculate, the apical four joints with a short, distinct, sublateral peduncle. Mesonotum

longitudinally rugulose; scutellum rugulose, extending to posterior face of propodeum, frenum distinct, punctate; scutellum with scattered pale hairs along the side margins. Wings much abbreviated, barely reaching the middle of second tergite. Abdomen highly polished, longer than thorax, basally with short, fine striae and a few pale hairs on the sides, apically acute.

Length, 1.15 mm.

Described from a single female taken at Chilliwack, 13 September, 1927.

Aphanogmus canadensis, new species.

Male.—Black, antennae and legs piceous, scape apically paler; hind coxae, except dorsally, base of all tibiae and all metatarsi sordid yellow, rest of tarsi dusky brown. Head about one and three-quarters as wide as long viewed from above, slightly wider than the thorax. Eyes large, nearly reaching the occiput, which is feebly emarginate. Ocelli conspicuous, in a triangle, the lateral ocelli further apart than from front ocellus or eyes, much nearer to the occiput. Vertex finely reticulate, depressed before front ocellus; frons more finely sculptured; facial depression smooth, with a broad raised area above the base of mandibles, extending upwards toward front ocellus, above this a small, slightly raised tubercle. Antennae slightly longer than the entire body; scape obclavate, as long as joints 3 and 4 combined; pedicel subglobular, about one-third as long as joint 3; joints 3-10 elongate, laterally constricted at base, apically obliquely truncate; joints 4-10 subequal, slightly shorter than joint 3 which is about three times as long as thick; apical joint equal to joint 3, cylindrical, conically pointed at tip; all flagellar joints with sparse, long hairs. Pronotum invisible from above. Mesonotum and scutellum with similar, but coarser, sculpture to the vertex; posterior margin of mesonotum slightly emarginate; scutellum longer than mesonotum, reaching posterior face of propodeum; frenal grooves uniting a considerable distance from base of scuttellum. Propodeum with the posterior angles shortly, acutely produced. Wings subhyaline, venation brown, radius almost straight, as long as marginal vein. Abdomen highly polished, shorter than thorax.

Length, 0.97 mm. Expanse, 1.8 mm.

Described from two specimens taken at Hollvburn, 8 June, 1928, and 3 July, 1929.

Paratype sent to Mr. Robert M. Fouts.

Aphanogmus obsoletus, new species.

Female.—Black; antennae piceous brown, apex of scape paler; legs piceous brown, apex of front femora, front tibiae and extremities of middle and hind tibiae paler; front tarsi pale brown; middle and hind tarsi yellowish-brown, apical joint of all tarsi dusky. Head about one and one-half times as wide as long, slightly wider than the thorax; eyes large, not reaching the occiput, which is almost straight; occili conspicuous, in a triangle; lateral occili about as far apart as from the occiput and further than this from the eyes. Vertex shagreened; depressed before front occilus; facial depression almost smooth, with a rounded

ridge extending from the base of the mandibles almost entirely across the depression. Antennae robust; scape thickest near the base, as long as pedicel and joints 3–5 combined, one-third as long as entire flagellum; pedicel as long as joint 3; joint 3 two and one-half times as long as thick; joints 3–9 subequal in length, gradually becoming thicker, joint 9 only slightly shorter than joint 3, one and one-half times as long as thick; apical joint two and one half times as long as thick, twice as long as the preceding joint. Thorax one and one-half times as long as wide; pronotum invisible from above, mesonotum and scutellum with the sculpture slightly finer than that of the vertex; frenum distinct, anterior margin of basal lobes of scutellum concave; pleurae smooth; posterior angles of propodeum not produced. Wings subhyaline, with a very faint brownish band across the disc, venation brown, radius wanting. Abdomen highly polished, somewhat shorter than the thorax.

Length, 0.97 mm. Expanse, 1.95 mm.

Described from a single specimen taken at Hollyburn, 12 May, 1928.

Aphanogmus dorsalis, new species.

Female.—Head and thorax black; scape and pedicel pale yellow, flagellum grading from pale yellow to light brown in the last four joints; front coxae black, trochanters yellowish-brown; femora, except apically, brown; tibiae and tarsi pale yellow; middle coxae basally black, trochanters and coxae apically yellow; middle femora brown, the extremities paler; middle tibiae and tarsi pale yellow, the tibiae brownish in the middle; hind coxae, except the extreme base which is black, trochanters and femora pale yellow; hind tibiae brown, the extremities paler; hind tarsi pale yellow, the metatarsi pale brown; abdomen ventrally yellow, anterior face of second tergite and a large dorsal area, which reaches a little beyond the middle, also yellow, the rest black. Head and thorax smooth; head one and one-half times as wide as long, wider than thorax; eyes large, almost reaching the occiput, which is nearly straight; ocelli conspicuous, in a triangle, the lateral ocelli about as far apart as from the occiput and further than this from the eyes; facial depression smooth and polished. Antennae slender, subclavate; scape obclavate, as long as pedicel and joints 3 and 4 combined; pedicel and joints 3-9 equal in length but becoming gradually thicker; joint 9 twice as long as thick; apical joint one and one-half times as long as preceding joint. Thorax about one and two-thirds as long as wide; vertex, mesonotum and scutellum with microscopic, reticulate, incised sculpture and scattered pale hairs; scutellum very convex, longer than mesonotum, reaching posterior face of propodeum, with a distinct, punctate frenum and with a long, narrow, smooth field, almost reaching the apex, enclosed by two longitudinal, posteriorly convergent carinae; hind angles of propodeum subacute. Wings subhyaline, with a broad, faint, fumose band across the disc, the apex beyond the radius also faintly fumose; costal and marginal nervures brown; radius pale, straight, longer than marginal nervure. Abdomen highly polished, shorter than thorax, base of second tergite without distinct striae.

Length, 0.9 mm. Expanse, 1.8 mm.

Described from three specimens from Hollyburn, 18 June and 3 July, 1928.

Paratype sent to Mr. Robert M. Fouts.

CONOSTIGMUS Dahlbom.

Conostigmus pulchellus, new species.

Male.—Black; scape basally brownish yellow, becoming darker on the apical half; pedicel and flagellum black; legs yellowish brown; front tarsi and apical joints of middle and hind tarsi dusky brown; wings fumose, with a darker cloud on disc below radius; venation and stigma dark brown. Head, viewed from above, twice as wide as long, very slightly wider than thorax, obliquely narrowed behind the eyes, which are remote from the occiput; occiput separated from vertex by a carina which is adjoined by a row of punctures; ocelli in a triangle, the lateral ocelli about as far apart as from the eyes and more than this distance from the occiput, considerably in front of hind margin of eyes; vertex and frons coarsely rugose; frons with a depression before front ocellus and with a median. vertical groove extending from this depression towards the clypeus; facial depression smooth, with a deep central pit. Antennae pubescent, slender, filiform, a little longer than the entire body; scape thicker then flagellum; pedicel short, subglobular; joint 3 the longest, longer than scape, six times as long as thick; joints 4-10 becoming shorter and slightly thinner; joint 10 slightly less than one-half as long as joint 3; apical joint slightly longer than preceding joint. Mesonotum and scutellum alutaceous, the lateral lobes of the former and scutellum less conspicuously so; scutellum as long as mesonotum, frenal lines punctate, meeting at anterior margin of scutellum. Propodeum rugese; pleurae smooth, each with a row of conspicuous punctures. Head and thorax with fairly dense, scattered pale hairs. Wings with the subcostal nervure somewhat swollen before reaching the stigma; stigma twice as long as wide; radius gently curved, one and one-half times as long as stigma. Abdomen elongate-oval, considerably longer than thorax, highly polished, constricted and with a few, longitudinal striae at base; second tergite nearly twice as long as rest of abdomen.

Length, 2.9-3.3 mm. Expanse, 4.7-5.6 mm.

Described from four specimens taken at Hollyburn, 18 June, 11 July, 1928; 3 and 30 September, 1929.

DIAPRIIDÆ.

MONELATA Foerster.

Monelata nigra, new species.

Female.—Black, polished; antennae with scape, pedicel and proximal flagellar joints reddish brown; flagellar joints becoming darker distally, the apical three or four joints black; legs pale brown, the swollen parts of femora and tibiae dark brown; coxae black; last joint of all tarsi dusky; wings very faintly fumose, venation brown. Head subglobular, viewed from above a little longer than wide; ocelli in an equilateral triangle, much nearer together than to the eyes

and occiput; sides of occiput with brownish, woolly pubescence. Antennae slightly longer than head and thorax combined, two-thirds as long as entire body; scape as long as pedicel and five following joints combined; flagellum two and one-quarter times as long as scape; pedicel as long as joints 3 and 4 combined; joint 3 about as long as two following joints combined; joints 4-9 about as long as thick; joints 10-12 becoming thicker, joint 12 distinctly transverse; apical joint (club) very large, oval, a little more than twice as long as thick, as long as four preceding joints combined. Pronotum short, sides and dorsum, except in the middle, clothed with woolly pubescence; mesonotum with the hind margin feebly convex; scutellum basally broad, narrowed about one-third from base, beyond this with the sides straight and parallel; hind margin straight, posterior angles rounded; propodeum with a distinct, much raised, median carina, the sides clothed with dense woo'ly pubescence; propleurae and mesopleurae smooth; metapleurae hairy; petiole surrounded with dense woolly hairs. Abdomen as long as head and thorax combined; second tergite widest near the hind margin, about one and one-half times as long as wide, the base ventrally hairy; remaining abdominal segments very short.

Length, 1.5-1.65 mm. Expanse, 2.8-3.0 mm.

Described from twelve specimens taken at Hollyburn on various dates from 9 May to 18 September, 1928–30.

Paratypes sent to U. S. N. M., Dr. A. A. Ogloblin and Mr.

Robert M. Fouts.

ACANOSEMA Kieffer.

Acanosema sylvana, new species.

Female (Type).—Head, thorax and petiole black; antennae brown, the three or four distal joints blackish; legs brown, base of hind coxae black; abdomen dark brown, wings strongly tinged with brown, venation and tegulae brown. Head smooth and polished; viewed from above about one and one-half times as wide as long, about as wide as thorax; ocelli in a triangle, lateral ocelli separated by slightly less than their distance from the eyes, much further than this from the occiput; occiput, except in the centre, with a ring of pale, tomentose pubescence. Antennae as long as head, thorax and petiole combined, scape terminating in two short, dentate processes, as long as following five joints combined, a little more than four times as long as pedicel; joint 3 one and one-quarter times as long as pedicel, two and one-half times as long as thick; joints 4-14 about equal to pedicel, gradually increasing in thickness; joint 14 as thick as long; apical joint twice as long as preceding joint, nearly twice as long as thick. Thorax smooth and shining; pronotum clothed with dense, pale, tomentose pubescence; mesonotum with deep, percurrent, posteriorly convergent notauli; scutellum with a very deep basal fovea, the sides and apex with long, pale hairs; propodeum with a broad, much raised median carina, having a fine groove down the centre; propleurae and mesopleurae smooth; metapleurae and base of hind coxae hairy. Petiole wider than long, widest in the middle, without striae, anterior margin straight, much narrowed posteriorly. Wings with first abscissa of radius very short, perpendicular to the marginal nervure which is three and one-half times

as long as first abscissa of radius; second abscissa of radius, cubitus, discoidal, median and brachial nervures present as fuscous streaks; second abscissa of radius very long, enclosing an elongate area more than twice as long as marginal nervure; cubitus straight, directed towards the basal nervure, the extreme apex deflected towards the discoidal nervure. Abdomen highly polished, elongate-oval, apically acute, including petiole one and one-third times as long as head and thorax combined; second tergite one and one-half times as long as wide, about one and three-quarters times as long as remaining segments combined; sides and ventral surface of propodeum, petiole and base of second tergite, except narrowly in the centre of dorsum, with long, pale, woolly hairs.

Length, 4.5 mm. (including ovipositor 5.6 mm.). Expanse, 7.0 mm.

Male (Allotype).—Antennae with the scape and pedicel light brown, the flagellum very dark brown, slender, longer than head, thorax and petiole combined; scape twice as long as joint 3; pedicel subglobular; joint 3 excised on basal half, two and one-half times as long as pedicel and slightly longer than joint 4; joints 4–13 gradually shorter; joint 13 about half as long as joint 3 and about one and one-half times as long as thick; apical joint about as long as joint 3. Petiole nearly one and one-half times as long as wide, smooth, the sides convex, constricted at base, without distinct striations. Abdomen elongate-oval, including petiole as long as head and thorax combined; second tergite about one and one-half times as long as wide; following segments to the sixth successively shorter. In other characters agrees with the female. The proportions of the petiole vary to some extent, some examples having it nearly as wide as long. The color varies slightly in depth and one specimen has the petiole dark brown like the abdomen. The second abscissa of the radius sometimes fails to quite reach the costal margin of the forewing.

Length, 3.0-4.2 mm. Expanse, 6.0-8.0 mm.

Described from a single female taken on 27 August, 1930, and twelve males on various dates from 5 July to 2 October, 1928–9; all from Hollyburn.

Paratypes sent to U. S. N. M., Dr. A. A. Ogloblin and Mr.

Robert M. Fouts.

EPIBLEMA STRENUANA WALK., THE HOST OF CERTAIN PARASITES OF THE ORIENTAL FRUIT MOTH, LASPEYRESIA MOLESTA BUSCK (LEPIDOPTERA).

By H. W. Allen and Earl Lott, U. S. Bureau of Entomology, Moorestown, N. J.

One of the interesting new developments in the study of the parasites of the oriental fruit moth is the discovery that a common and widely distributed borer (*Epiblema strenuana* Walk.), the larvae of which occur in the stems of ragweed (*Ambrosia artemisiaefolia*), serves as an alternate host for several of the more important parasites of the oriental fruit moth.

The parasites of the oriental fruit moth which have been reared from Epiblema strenuana are Macrocentrus ancylivora Roh., M. delicatus Cress., Glypta rufiscutellaris Cress., Pristomerus ocellatus Cush., and Cremastus minor Cush. In New Jersey. the first three mentioned are the most important parasites of the larvae of the oriental fruit moth, and are also among the more abundant parasites of E. strenuana. The identity of the parasites reared from E. strenuana was established by Mr. R. A. Cushman from adults reared from field-collected larvae, and was corroborated in the case of two of the species, namely, M. ancylivora and G. rufiscutellaris, by the observation of mating of individuals of one sex reared from the oriental fruit moth with individuals of the opposite sex reared from E. strenuana. The host was determined by Mr. Carl Heinrich. In a total of 284 borers reared from the stems of Ambrosia collected near Moorestown, N. J., between August 13 and September 3, last, 10 per cent were parasitized by M. ancylivora, 23 per cent by M. delicatus, 18 per cent by G. rufiscutellaris, and 5 per cent by P. ocellatus. Only 17 per cent of the host adults emerged, the combined parasitism being 83 per cent. From several collections of the same brood of E. strenuana obtained from points in Pennsylvania, Ohio, and Indiana, no M. ancylivora was reared. However, numerous G. rufiscutellaris and M. delicatus were reared from the three States mentioned, and P. ocellatus from Pennsylvania and Ohio.

The host, E. strenuana, is very widely distributed in the United States westward to the Rocky Mountains. Like the oriental fruit moth, it belongs to the Eucosminae, and its larvae bore in the stems of the host plant as do the larvae of the earlier generations of the oriental fruit moth. It occurs in great abundance over thousands of acres of grain stubble, weedy crops, and field and roadside borders which are overgrown with ragweed in middle to late summer. E. strenuana apparently serves as a very important reservoir for parasites of the oriental fruit moth at certain periods of the year when the larger proportion of the larvae of this host are embedded in fruit and hence

not accessible to attack by its larval parasites.

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NOTES ON TYPES (HYMENOPTERA: CYNIPIDAE).

By Lewis H. Weld, East Falls Church, Virginia.

During the two decades or more that Professor J. J. Kieffer worked on the Cynipidae it appears that he never visited the leading entomological museums of Europe to study types but depended mainly on the literature for his understanding of the existing genera. This dependence on the literature alone led to a misunderstanding of some of the Ashmead genera. It led him into error also in the case of some of the genera established by Europeans so that in creating some 55 new genera himself he has made some synonyms especially in cases where the older authors had placed their genera in the wrong subfamilies. No student of the Cynipidae hitherto has attempted to locate and study the types of the genotype species. Recently the writer visited three of the European museums with this as a definite object and it seems desirable to place on record some of the information and conclusions which resulted from this incomplete preliminary study.

PARAMBLYNOTUS Cameron.

Allocynips Kieffer, 1914 Phil. Jour. Sci. D 9: 185. Synonymy new.

Cameron placed his genus *Paramblynotus* in the Figitinae but the holotype female of the genotype species, punctulatus, in the British Museum has not the characteristic segmentation of the abdomen of a Figitid, tergite five and not tergite three being the largest and it is preceded by three (instead of one) shorter, non-liguliform tergites. The genus should be transferred to the Liopterinae. Allocynips borneensis Weld is a synonym of it and should be known as Paramblynotus punctulatus Cameron. (Synonymy new.) Allocynips ruficeps Kieffer, the genotype of Allocynips, is a synonym of Paramblynotus ruficollis Cameron. (Synonymy new.) All the other described species of Allocynips should be transferred to Cameron's genus and known as: Paramblynotus clarus (Weld); P. dyak (Weld); P. malayensis (Weld); P. isosceles (Weld); and P. flaviceps (Kieffer). (Combinations new.) The male which Cameron received later and subsequently described as the male of his punctulatus seems to me to be erroneously associated and to be an undescribed species.

PSEUDIBALIA Kieffer.

One of the characters given for this genus is that the metatarsus of the hind leg is prolonged "au côté interne" into a blunt spur reaching the end of the second segment. The holotype female of the genotype species, fasciatipennis, in the British Museum has this spur on the outer side as it is in Ibalia and not on the inner as described by Kieffer. The petiole is described as 3-4 times as long as broad but measured by a micrometer it is barely three times as long as broad when viewed from above. The relative lengths of the tergites along the dorsal curvature are as (petiole) 17 (width 534): 6:9:23:9:7:9. Height of abdomen 33 and width 23. As both Pseudibalia Kieffer and Paribalia Weld have the tarsal spur on the outer side the latter genus may be distinguished by having a short petiole (not longer than broad) and having the fifth tergite (instead of the fourth) largest.

NERALSIA Cameron.

Xyalosema D T & K. 1910 Das Tierreich Lief. 24:94. Synonymy new.

Neralsia was based on N. rufipes from Guatemala and was described (1883, Biol. Cent.-Amer. Hym. 1:74, Pl. 4, fig. 9) as having a closed radial cell (although Cameron's figure shows it open) and thought to be intermediate between the Anacharitinae and Figitinae. Das Tierreich put it in the Aspicerinae. The type in the British Museum is one of the Figitinae. The abdomen is longer than head plus thorax, the second tergite striate at the base, not liguliform, shorter than the third. The wing is normally pubescent and ciliate and the radial cell is open on the margin. The eyes are sparsely hairy and not bare as stated. Solenaspis Ashmead 1887, preoccupied by Osten Sacken in Diptera in 1881 and renamed by Dalla Torre and Kieffer in 1910, is congeneric with this and the name Xyalosema should become a synonym of Neralsia in the Figitinae. Solenaspis singularis Ashmead is a Xyalophora (Comb. new). To the genus Neralsia should be transferred the following species:

Neralsia armata (Say) (Diplolepis) 1836 Boston Jour. Nat. Hist. 1: 266. Comb. n.

Neralsia hyalinipennis (Ashmead) (Solenaspis) Genotype. 1887 Trans. Amer. Ent. Soc. 14: 155. Comb. n. = dubiosa Kieffer (Xyalosema) 1910 Boll. Laboro. Zool. Portici 4: 338. Syn. n.

Neralsia ciliatinervis Kieffer (Xyalosema) 1910 Boll. Laboro. Zool. Portici 4: 339. Comb. n.

Neralsia evanescens Kieffer (Xyalosema) 1907 Ent. Ztschr. Stuttgart 21:157. Comb. n.

ANACHAROIDES Cameron.

Coelonychia Kieffer, 1910 Wiss. Erg. Deutch. Zent.-Afr. Exp. 1907–8, 3 (2): 19. Synonymy new.

Cameron's genus was based on Anacharoides striaticeps (Rec. Albany Mus. 1: 160, 1904) from Cape Colony and placed in the Anacharitinae. The type is in the British Museum and it belongs in the Aspicerinae for the second tergite is liguliform, the wings bare and the veins very pale. The type of Coelonychia spinosipes in the Berlin museum is congeneric with this. Therefore Kieffer's Coelonychia, correctly placed in the Aspicerinae, becomes a synonym of Anacharoides Cameron.

BOTHROCHACIS Cameron.

Stirencoela Cameron, 1910 Entomologist 43: 180. Synonymy new.
Ditrupaspis Kieffer, 1910 Wiss. Erg. Deutch. Zent.-Afr. Exp. 1907–8, 3 (2): 18,
Synonymy new.

Cameron's Bothrochacis was founded on two males of Bothrochacis erythropoda from Cape Colony. Six years later he founded the genus Stirencoela on a male of Stirencoela striaticollis, also from Cape Colony. The types of both are in the British Museum and they seem to me to be not only congeneric but the same species (Synonymy new.) The type of Ditrupaspis semirufa Kieffer from N. Nyassa preserved in the Berlin museum is congeneric with the above. Hence I conclude that both Stirencoela and Ditrupaspis should become synonyms of Bothrochacis Cameron.

ANDRICUS Hartig.

Oncaspis Dettmer, 1925 Natuurhist. Maandb. Maastricht 14:123. Euschmitzia Dettmer, 1925 Natuurhist. Maandb. Maastricht 14:122. Synonymy new.

Type material of *Oncaspis filigranata*, the genotype species, seen in Berlin in 1929, runs to *Andricus* and Professor Dettmer wrote me in April, 1927, that he had discovered that it is "almost certainly the long sought for sexual generation of *Andricus solitarius* (Fonsc.) and not a new genus." In 1928, he published a description of the gall and his evidence that it is the sexual generation of *Andricus solitarius* (Fonsc.) in Marcellia 24: 142. His *Euschmitzia rara*, the genotype, was thought to be a guest-fly in a *Rhodites* gall but as his description was not that of an inquiline his attention was called to the possibility of error and under date of May 1, 1929, he writes me that this species is the sexual generation of *Andricus nudus* Adl. and requests that I

publish it. Thus both of his new genera become synonyms of Andricus.

CALLIRHYTIS Förster.

In the original description of the genotype, Callirhytis hartigi Förster, it is not stated whether or not the tarsal claws are toothed. Mayr in 1902 considered them as simple and Ashmead in his key to genera in 1903 reversed Mayr's interpretation by putting species with simple claws in Andricus (whose genotype has toothed claws) and those with the claws toothed in Callirhytis, thus causing a confusion which has persisted to the present day. Das Tierreich has followed Mayr's interpretation but its authors seem to be unacquainted with the genotype species. The museum in Vienna has two specimens labelled 'Aachen, Call. Hartigi, Förster's type. Collect. G. Mayr." They are males. Without having seen females I venture the guess that this is the sexual generation of a species whose agamic generation will be found to be in "stone galls" inside of acorns. From the above specimens the following notes are made to supplement Förster's original description:

Callirhytis hartigi Förster.

Male.—Amber-colored. Head coriaceous, from above transverse, occiput concave, wider than thorax, cheeks not broadened behind eyes. Malar space .17 eye without groove. Flagellum filiform with cylindrical segments, the first curved and enlarged distally and not quite as long as the second, the last only slightly longer than the penultimate. Mesoscutum with low sharp transverse ridges well separated from each other on a uniformly smooth surface. The parapsidal grooves not very distinct even posteriorly and obsolete in front. Scutellum with transverse groove at base and a suggestion of small narrow pits which open out behind on to disk which is transversely rugose. Mesopleura smooth below, coriaceous across middle, the first and second coxae far separated. Carinae on propodeum straight and parallel. Claws are simple. Wing seems to be normally pubescent and ciliate. First abscissa of radius arcuate, second straight. Abdomen shorter than thorax, longer than high, tergites along dorsal curvature as 30:9:1:0:6.

Callirhytis azteea (Cameron). Comb. new.

Andricus (Aphilothrix) aztecus Cameron, 1897 Ann. & Mag. Nat. Hist. (6) 19:261.

The holotype female in the British Museum from Sonora, Mexico, proves to be a *Callirhytis* with hyaline, non-ciliate wings and running to couplet 23 in Section B of my key in Proc. U. S. N. M. 61, Art. 19:11. It is evidently from a "stone gall" in an acorn.

Callirhytis defecta Kieffer.

This American species whose types are in Berlin is also one of the "stone gall" in acorn group and runs to couplet 21 on p. 11 in the above mentioned key.

Amphibolips arcuata (Kieffer). Comb. new.

Callirhytis arcuata Kieffer 1910 Boll. Laboro. Zool. Portici. 4:341.

Of the three specimens in the Berlin Museum all collected by Klug in Georgia and all labelled as types, and supposedly of Kieffer's species above, only one agrees with the description. It is the one numbered "8070" and is here transferred to the genus Amphibolips. The number 8037 is a Callirhytis and 8022 is a Disholcas pis.

HOLOCYNIPS Kieffer.

This genus was founded by Kieffer on a single captured specimen from Georgia described as Holocynips emarginata and the genus has hitherto remained unrecognized in our fauna by American students. A study of the holotype in the Berlin Museum shows that the first three species in the writer's key to the root gall forming species of Callirhytis in Proc. U. S. N. M. 59: 213 (1921) are congeneric and should be transferred to this genus. Moreover, corallosa Weld (1921) proves to be the same species as emarginata Kieffer (1910). As this had been suspected, a paratype of corallosa had been taken along to Berlin and the above conclusion is the result of a direct comparison. But corallosa had previously been shown to be a synonym of Amphibolips badius Bassett (1922, Proc. U. S. N. M. 61, Art. 18: 17). Thus recognizing the validity of Kieffer's genus the names of its three species are:

Holocynips badia (Bassett). Comb. new.

Amphibolips badius Bassett (= Callirhytis corallosa Weld). Synonymy published. Holocynips emarginata Kieffer, 1910 Boll. Laboro. Zool. Portici 4: 114. Synonymy new.

A further note on the biology of the species is here added. An adult was taken ovipositing in the buds at the summit of a thrifty shoot of Quercus alba L. at East Falls Church, Va., on April 13, 1924. The alternating generation is unknown. One was captured on the roof of the Education Building 125 feet above the sidewalk and a mile from any oak trees in Albany, N. Y., on April 15, 1927.

Holocynips hartmani (Weld). Comb. new Holocynips maxima (Weld). Comb. new.

A fly of this species was taken ovipositing in the buds of *Quercus alba* L. at Washington, D. C., on March 27, 1921; another was taken April 15, 1924, and two more on April 20. At East Falls Church, Va., one was taken ovipositing in buds of white oak on April 18, 1927, and others on April 6, 13, 19, 20, 1928. The alternating generation is unknown. One was captured on the roof of the Education Building in Albany, N. Y., on April 20, 1927.

LIODORA Förster.

Förster's types of *Liodora sulcata*, the genotype species, were studied, two specimens in Berlin and four in Vienna. They do not seem to me to be congeneric with the sexual generation of *Diplolepis folii* (L.) and it is my present opinion that Das Tierreich has been in error in including *Liodora* in *Diplolepis* and that it would be better to maintain it as separate genus. Through the kindness of Dr. F. Maidl the U. S. National Museum has been able to acquire one of the Vienna specimens in exchange and from this the following notes have been made to supplement Förster's original description.

Liodora sulcata Förster.

Female.—Head from above transverse, as broad as thorax, not broadened behind eyes, occiput slightly concave. Malar space .4 eye without groove. Antennae 14-segmented, relative lengths as (scape) 15 (6): 8 (6): 15 (5): 13: 11:10:9:9:9:8:8:8:8:8 (6):11. Pronotum "narrow," pubescent on sides. Mesoscutum as broad as long, smooth and shining with a few scattered hairs anteriorly, parapsidal grooves deep, smooth, percurrent, separation at hind margin about three times the width of a groove. No median. Anterior and lateral lines scarcely visible. Scutellum rugose, pubescent, distinctly overhanging metanotum behind, with two deep, smooth, elliptical pits at base separated by a distinct septum. Mesopleura smooth and shining with a few scattered hairs below. Propodeum with two almost straight and parallel carinae enclosing a transverse smooth bare area with no median. Tarsal claws with a distinct tooth. Wing normally pubescent and ciliate, radial cell about four times as long as broad, first abscissa of radius arcuate and one-fifth as long as the second which is straight. Areolet small, reaching one-ninth and the cubitus about three-fourths way to basal. Abdomen sessile, the short rugose neck of propodeum not reaching as far back as the tip of the scutellum; length to height to width as 65:55:44. Lengths of tergites along dorsal curvature as 50:12 (rest hidden), the second with usual pubescent patches at base and hind margin in side view a straight line at angle of 45 degrees to longitudinal axis. Sheaths at same angle, the tips projecting slightly dorsally behind second tergite. Ventral spine in side view directed amost horizontally backward, slender, four times as long as broad at base, a few hairs on ventral surface of hypopygium but scarcely any on spine. Using the width of the head as a base the length of mesonotum ratio is 1.3, length of antenna 2.27, length of wing 4.0. Length of body 2.1 mm.

PANTELIELLA Kieffer.

Through the courtesy of Dr. F. Maidl of the Vienna Museum the U. S. National Museum was given a portion of the type gall cluster of *Panteliella fedtschenkoi* (Rübsaamen), genotype species, on leaf of *Phlomis tuberosa* L. from "Bijou-Onlar, Krim." After relaxing the galls I was able to cut out two adults from which the following notes are made to supplement the original description.

Panteliella fedtschenkoi (Rübsaamen).

Female.—Brown, the head and abdomen lighter, legs yellowish. Head from above transverse, wider than thorax, occiput slightly concave; from in front broader than high, interocular area 1.5 times as broad as high, malar space .6 eye without groove. Antennae 14-segmented, relative lengths of segments (in balsam mount) as (scape) 21 (14): 24 (14): 24 (11): 24: 24: 23: (15): 21: 21:20:20 (15):20:20:20:30 (13). Pronotum "broad" in the median line as in the Aylax group. Mesoscutum under magnification of 75 coriaceous, aciculate behind, without distinct parapsidal grooves (their position however and that of a median is faintly indicated in the sculpture). Scutellum finely rugose with two distinct smooth pits at base separated by a septum from which fine ridges spread out fanwise on to disk. Mesopleura aciculate. Tarsal claws in balsam mount simple (not "weakly toothed"). Wing normally pubescent, first abscissa of radius heavy, straight, about one-sixth length of second which is straight also. Abdomen higher than long, relative lengths of tergites along dorsal curvature as 30: 8: 4: 3: 2: 6, second occupying .68 length of abdomen. Ventral spine in side view about twice as long as broad. Using the width of the head as a base the length of mesonotum ratio is 1.0, length of antenna 2.0, length of wing 3.1. Length of body 1.15 mm.

Synergus filicornis Cameron.

Synergus furnessana Weld, 1913, Insecut. Insc. Menst. 1: 134, Pl. 4, figs. 8-13. Synonymy new.

The Cameron holotype female from Guatemala in the British Museum has the mesopleura all black. Except on this one point the description of my furnessana from Mexico agreed with it. I recalled however that there was some variation in color in the type material of furnessana and on my return I found among the paratypes a female with black mesopleura. This was sent to London where through the kindness of Dr. James Waterston and Mr. R. B. Benson a direct comparison

was made with the Cameron type. "Furnessana is apparently the same as filicornis. Neither of us can see anything to distinguish them. The color is exactly similar." Hence I conclude that I have redescribed Cameron's species under the name of furnessana which should now go into synonymy.

Information is desired as to the location of the types of any of the following Kieffer species of Cynipidae: Callirhytis marianii (meunieri); Holocynips nigra (1916 from Philippines, not 1910); Lambertonia abnormis; Liebelia cavarae; Lytoxysta brevipalpis; Parandricus mairei; Poncyia ferruginea; Salpictes rufiventris, Tavaresia carinatus; and Tylosema nigerrimus.

THE OCCURRENCE OF THE CRICKETS ANAXIPHA PULICARIA BURM. AND CYCLOPTILUM TRIGONIPALPUM (RHEN AND HEBARD) IN THE VICINITY OF THE DISTRICT OF COLUMBIA, HITHERTO UNREPORTED HERE.

By H. A. Allard, U. S. Department of Agriculture, Washington, D. C.

Anaxipha pulicaria Burm.

For a number of years I have made field observations on a tiny cricket occurring in the deep ground debris of cold, wet swampy bogs around Clarendon and Barcroft, Virginia. This tiny cricket appears very early in May and usually becomes silent before July 1. Its stridulation is a continuous weak nemobious-like trill. The crickets are very difficult to capture and the small amount of material examined by Mr. A. N. Caudell of the U. S. National Museum and myself was tentatively pronounced a physiological form of *Anaxipha exigua*. A discussion of this cricket was made in my paper, "Physiological Differentiation in Overwintering Individuals of Certain Musical Orthoptera," *The Canadian Entomologist*, LXI, September, 1929, 195–198.

In 1929 further observations were made in a bog near Barcroft, Virginia, and additional material obtained. On the suggestion of Mr. B. B. Fulton that our material was perhaps identical with a cricket he had been studying in central North Carolina in similar habitats, and known as *Anaxipha pulicaria* Burmeister, careful comparisons of this additional material were made by Mr. Caudell with *Anaxipha exigua*.

This examination has led to a separation from *Anaxipha* exigua material on the basis of several characters. In both sexes all exigua material shows a more or less well-marked dark

longitudinal stripe along the lower half of the outer face of the hind femora. This stripe may vary in intensity, sometimes being very faint, but it is never absent. Likewise in exigua material the ovipositor is fully ½ as long as the hind femora.

All material from the deep ground debris of the cold, wet bogs around Clarendon, and Barcroft, Virginia, consistently lacks this longitudinal dark stripe on the hind femora, and the ovipositor is distinctly less than ½ as long as the hind femora.

The color and morphological differences, together with its restricted bog habitat, its occurrence in the adult form many weeks before the adults of A. exigua, and the distinctiveness of its trill in comparison with the notes of A. exigua, make it fairly certain that the cricket is the more southern species Anaxipha pulicaria.

This cricket has heretofore not been reported farther north than Raleigh, North Carolina, its range extending southward

into Florida, Texas, Mexico and Jamaica.

With the final separation of these crickets from A. exigua and their identification as Anaxipha pulicaria, we have added to the Orthopteran fauna of the District of Columbia a cricket hitherto unknown in this region.

Cycloptilum trigonipalpum (Rhen & Hebard).

Near sundown on the evening of June 30, 1930, while reading, I heard a few shrill ringing sounds which finally attracted my attention as insect music. Later in the evening I again heard the same chirping sounds, and with a flash light traced them to the kitchen. The "singer" was finally located in a strawberry basket filled with currant stems and unripe currants—the debris remaining from fruit recently picked in the garden. The tiny cricket was finally captured and kept in a screened jar in my bedroom for the night. Occasionally I heard its leisurely delivered, shrill chirps, tiiiiiii, reminding me of the chirps of the jumping tree cricket (Orocharis saltator) in pitch, but of finer quality and less trilling tone.

This cricket was identified by Caudell as Cycloptilum trigonipalpum Rehn & Hebard, being the first record of this southern species for the vicinity of the District of Columbia. The northern-most reported occurrence is Petersburg, Virginia, south of Richmond. No other individuals have been seen or heard since this solitary individual appeared at Lyon Park,

Virginia.

While it is possible that this individual may have been inadvertently transported by some motor carrier or other agency from points farther southward, where it is of general occurrence, there is quite as good reason to infer that all the localities of its northern-most distribution have not yet been determined. In this connection it may be said that in the case of the little southern cricket *Anaxipha pulicaria*, its occurrence around Washington, D. C., which at the present time seems to be its northern-most limit, is likewise extremely variable and irregular. As a matter of fact, slightly favorable or unfavorable conditions near the limits of the range of a creature, may determine its presence or absence in a locality.

THE NORWAY MAPLE NEPTICULA (LEPIDOPTERA).

By E. P. FELT,

Director and Chief Entomologist, Bartlett Tree Research Laboratories, Stamford, Conn.

This European insect, Nepticula sericopeza Zeller, determined by August Busck of the U. S. National Museum, first came under observation in America, June, 1928, through the persistent

dropping of large numbers of Norway maple leaves.1

An examination of these leaves showed that at the very lower part of the leaf stem for a distance of about half an inch, there was a somewhat characteristic, variable, sooty black discoloration and at a point almost exactly half an inch from the base of the leaf stem there was a minute, white, elevated, oval object suggestive of a fungus fruiting body and presumably consisting of dried sap which had exuded from the point of oviposition. The interior of the leaf stem from this point nearly to the very base was traversed by a very minute channel or mine about three-eights of an inch long, and some at that time contained a nearly transparent, very slender larva about a sixteenth of an inch long and with a diameter of approximately one-fiftieth of an inch. The caterpillar has a light brown, semi-transparent head with strongly supporting chitinous rods and margins. The body segments are smooth, whitish, transparent and the posterior segment somewhat produced along the middle line and with sub-lateral, oblique, chitinous rods or spines and also a

¹Nepticula sericopeza Zeller, discovered by Dr. Felt in eastern United States and presumably a recent introduction from Europe, may be distinguished among the nearly three hundred described species of the genus by its coloration: Head reddish yellow; collar whitish; eyecape ochreous white; forewings blackish brown with base, an outwardly curved fascia before the middle and opposite costal and dorsal spots at apical third, white; underside of the forewing of the male with a large deep black sexscaling on basal half, containing a striking yellowish white, spoolshaped oblique spot. The genitalia of both sexes, typical of the genus, also present excellent specific characters.

AUGUST BUSCK.

sub-median, chitinous structure terminating in two curved rods.

The dropping of leaves continued till well toward the end of June and an examination of selected branches from a Norway maple some 60 feet high showed a somewhat general infestation throughout the tree, there being at that time approximately 10 per cent of the leaves infested. The earlier dropping was probably considerably in excess of this 10 per cent and it is believed that 25 per cent represents the minimum defoliation by the insect on the tree under observation. Attempts to rear the adult from these leaf stems and also from sod under the trees proved futile. Subsequent observations indicate that the insect is probably unable to complete its transformations in the leaf stems and that this habit is abnormal and occurs only when there are no seeds available for oviposition. The identification was made by collecting moths in June, 1929, and establishing them in cages on Norway maple. They produced the characteristic injury to the leaf stem and the correctness of this observation was confirmed by rearing large numbers from infested seeds

or keys in 1930.

There was a heavy crop of Norway maple seeds in portions of the northeastern United States in 1930 and in mid-June large numbers of these dropped from the trees. An examination showed the same type of injury as had been observed in 1928 and 1929, on the leaf stems. These proved to be inhabited by a very similar larva to that observed two years earlier, except that it was larger. Infested seeds, when green, are easily recognized by the sooty discoloration, indicating galleries which usually start at one point, and upon breaking the seeds apart, there are usually burrows along the suture partly filled with somewhat characteristic reddish orange borings. Recently infested seeds generally have the minute white spot, presumably dried sap, as in the case of leaf stalks. The identity of the earlier found moths was confirmed by rearing from infested seeds. It is noteworthy that a very large proportion of the earlier dropping larger seeds, namely nearly 99 per cent, were infested, while of the smaller seeds falling at the same time, less than 14 per cent were infested. Moths were observed in greater or less numbers throughout July and into August, though none were found in September, indicating that possibly the dry weather the latter part of the year had caused the seeds to harden to such an extent as to make them unacceptable for oviposition. There were certainly two and possibly three generations. Tutt in British Lepidoptera (Vol. 1, page 344-45, 1899) states that the species is double or probably continuously brooded, adults appearing in April-May from hibernating larvae, again in June-July and a third in August. The moister climate of England might easily make possible another generation than occurs in

this country. They were also taken in the Stamford area from

late May until into August.

The small, dusky, white-marked moths are a trifle over an eighth of an inch long when in the characteristic resting position. They have two somewhat indistinct silvery or whitish transverse bands and are most easily recognized by the fact that they are usually the more abundant small moths resting in the crevices of the bark of Norway maples. They remain quiet during most of the day, and when disturbed readily jump into the open mouth of a vial placed over them. They appear to be somewhat local, since the spraying of even one tree gives a very considerable freedom from infestation. The moths occur not only commonly on the rougher portion of the trunk, but also throughout the tree to some extent and on the leaves and fruit in mid-summer.

Larva. The full grown larva occurring in the seeds is three-sixteenths of an inch long, moderately stout, mostly pale yellow-ish green, shaded by the brown contents of the alimentary canal. The head is about three-fourths the width of the body segment and with well-developed jaws. Dorsally the head case has two sublateral tapering processes posteriorly, the sub-median margins thickened, the median sub-oval area membraneous. Ventrally there is a median chitinous rod, very suggestive of the breast bone of the gall midge larva. At the posterior extremity, there is a chitinous frame consisting of several lateral rods, united by a central approximately circular structure. The larva moves rather readily and in this stage has a series of rudi-

mentary true or prolegs, all apparently membraneous.

Cocoon. The freshly made, pale orange yellow, oval cocoons have a major diameter of about three-sixteenths of an inch. The cocoons are flattened, the edges merging smoothly with the surface upon which it rests. There is usually a somewhat distinctly colored margin between the outer edge of the cocoon and the pupal case within. The older cocoons change in color gradually from a pale orange to a variable yellowish or whitish orange. There were found on one tree a few remnants of what appeared to be much older cocoons than any which could have been produced by the spring generation of larvae. weathered to harmonize rather closely with the normal, somewhat variegated bark surface of the tree. The cocoons are spun commonly upon the bark, sometimes upon the seeds and even upon the leaves and may occur more or less throughout the tree. The insect hibernates in the cocoon. This habit makes a relatively wide distribution with nursery stock entirely probable and possible.

Distribution. The occurrence of this insect is most easily determined by examining the early fallen seeds. There is usually the minute white spot as on the leaf stems and the galleries

contain somewhat characteristic reddish orange borings or castings. It is easy by this means to secure records of a hitherto unsuspected wide distribution. Infested seeds were seen or received from the following localities:

New Hampshire: Portsmouth.

Massachusetts: Amherst, Ipswich, Lenox, Martha's Vineyard Island, South Hadley and Vineyard Haven.

Rhode Island: Barrington and Warwick.

Connecticut: Bethel, Bridgeport, Danbury, Fairfield, Greenwich, Hamden, Hartford, New Canaan, New Haven, Noroton, Norwalk, Ridgefield, Stamford, Thompson and Westport.

New York: Albany, Amawalk, Amenia, Bedford, Bronxville, Chatham, Croton Falls, Glen Cove, Haverstraw, Katonah, Lake George, New Hamburg, Mount Vernon, North Salem, Nyack, Pauling, Peekskill, Riverhead, Scarsdale, Syracuse, Tarrytown, Westbury, White Plains and Yonkers.

New Jersey: Plainfield and Red Bank.

Pennsylvania: Downington, near Philadelphia.

We have yet to learn of the occurrence of this insect west of Syracuse, although it was looked for in several places, including Cleveland, Ohio. This is possibly due to the infestation having been distributed from some eastern center. Seeds of other maples, especially the sugar maple and sycamore maple, were repeatedly examined without finding any evidence of the insect.

The wintering of this insect in cocoons upon the trees makes it very probable that a dormant oil application would practically eliminate the infestation. Applications in late May with a spray consisting of half pint of nicotine, 3 pounds of soap and two quarts of molasses to 40 gallons of water, gave a very promising degree of control. It killed adults and very probably prevented the issuance of moths from the cocoons. A dormant spray is probably more satisfactory.

A NEW SPECIES OF CHRYSOBOTHRIS INFESTING STRAW-BERRY PLANTS (COLEOPTERA: BUPRESTIDAE).

By W. S. Fisher, Bureau of Entomology, United States Department of Agriculture.

Chrysobothris fragariae, new species.

Chrysobothris sp. Riley, Insect Life, vol. 5, 1892, pp. 17-18.
Chrysobothris pubescens Fall,—U. S. Dept. Agric., Official Record, vol. 8, No. 24, 1929, p. 3 (misidentification).

Male.—Broadly elongate, subdepressed, moderately shining, uniformly dark brown, with a more or less distinct greenish bronze or coppery bronze tinge in certain lights, the elytra without or with only vaguely indicated longitudinal costae and greenish spots.

Head feebly convex, with the front rather broad and the sides obliquely narrowed to the vertex; occiput broad and longitudinally carinate; vertex and front flat, without impressions or carinae; surface rather densely, irregularly punctate, the punctures variable in size and well separated, sparsely clothed with long, very fine, semi-erect, cinereous hairs; intervals smooth; eyes large, narrow, moderately convex, equally rounded at bottom and top, and separated from each other on the occiput by about the same distance as between the antennal cavities; epistoma broadly, rather deeply, angularly emarginate in front, the lobe on each side broadly rounded; antenna extending to middle of pronotum, gradually narrowed toward apex, sparsely clothed with moderately long hairs, joints compact, transverse, and the third joint only slightly longer than the fourth.

Pronotum strongly transverse, one and three-fourths times as wide as long, widest near middle, and about equal in width at base and apex; sides rounded at apical angles, parallel along middle, and obliquely narrowed behind middle to posterior angles, which are obtuse; anterior margin strongly sinuate, the median lobe moderately produced and broadly rounded; base (visible part) broadly, arcuately emarginate at middle of each elytron, median lobe broadly rounded and subtruncate in front of scutellum; surface slightly uneven but without distinct depressions, rather densely, coarsely punctate, the punctures more or less confluent toward sides, and sparsely clothed with moderately long, erect, inconspicuous hairs; intervals finely, densely granulose. Scutellum very small, triangular, with the sides about equal in length.

Elytra distinctly wider than pronotum at base; sides broadly rounded at humeral angles, nearly parallel to apical third, then arcuately narrowed to the tips, which are conjointly, broadly rounded; lateral margins not distinctly serrate; humeri not prominent; base broadly, arcuately rounded; surface with small, moderately deep, basal depressions, three very vague greenish spots on disk, one in front and two behind, finely, irregularly punctate, the punctures denser on basal half, more or less transversely rugose, and sparsely, irregularly clothed with long, erect, cinereous hairs; intervals obsoletely granulose.

Abdomen beneath sparsely, coarsely punctate, sparsely clothed with long, recumbent, cinereous hairs; intervals nearly smooth; first segment convex at middle; last segment with the lateral margins finely serrate, without a submarginal ridge, but deeply, arcuately emarginate at apex. Prosternum with a broadly rounded, strongly declivous, median lobe in front, the surface densely, coarsely punctate, and rather densely clothed with long, fine, cinereous hairs; prosternal process nearly flat, strongly expanded behind the coxal cavities, and with a very large triangular tooth at apex. Femora robust; anterior pair with a large obtuse tooth on inner margin near middle, the exterior margin of tooth vaguely serrate. Anterior tibiae arcuate, with a rounded dilatation at apices; middle and posterior tibiae straight and cylindrical.

Female.—Differs from the male in being more robust, eyes more widely separated from each other on the occiput, antennal joints not quite so compact, last abdominal segment vaguely emarginate at apex, and the anterior tibiae without dilatations at apices.

Length, 6.4-8.6 mm.; width, 2.8-4 mm.

Type locality.—Grand Mound, Washington.

Other localities.—Washington: Easton; White Salmon; Medical Lake. Idaho: Coer d'Alene; Moscow.

Type, allotype and paratypes.—Cat. No. 43175, United States

National Museum. Paratype.—Collection H. C. Fall.

Described from thirteen examples, the type (male), allotype, and four paratypes from the type locality, reared from strawberry plants during March to July, 1930, by William W. Baker; two paratypes from White Salmon, Washington, reared from strawberry plants during July, 1930, by William W. Baker; two paratypes from Coeur d'Alene, Idaho (Bureau of Entomology No. 4765), reared from crowns of Sharpless strawberry plants sent to the Bureau by H. T. Back during 1890 and 1891; one paratype collected at Moscow, Idaho, by J. M. Aldrich; one paratype collected at Easton, Washington, by A. Koebele; one paratype collected at Medical Lake, Washington, July 14, 1920, by R. C. Shannon.

This species is closely allied to *pubescens* Fall, but differs from that species in being more uniformly bronzy brown, dorsal surface more densely punctured, foveae on elytra if present not impressed, and the costae on the elytra only feebly indicated.

The specimens examined show considerable variation in size, and in some of the examples the green spots and longitudinal costae are vaguely indicated, whereas in others these are not indicated. The specimens from the type locality are rather constant except in size, but some of the examples from the other localities show considerable variation from the type. In some examples the tips of the elytra are separately rounded, the sides of the pronotum slightly variable in shape, and in some of the females the sides of the elytra are slightly expanded behind the middle.

This species has been misidentified as pubescens and is probably confused in some collections under that name, but a specimen was sent to H. C. Fall, who has kindly compared it with his type and in a letter writes as follows: "It is not my pubescens and does not seem to be like anything else in my collection." It was first reported as boring into the crowns of Sharpless strawberry plants by H. T. Back, from Coeur d'Alene, Idaho, on September 1, 1890, and during that and the following year a considerable number of infested plants were sent to the Bureau of Entomology at Washington for rearing. In the Bureau file under number 4765 are the notes on this material made by L. O. Howard and Theo. Pergande, and these notes show that adults were reared as well as a lepidopteron, a tachinid, an anthomyiid, several small muscids, and a number of braconids, some of which were probably parasitic on the Chrysobothris larvae. Riley (1892) published a short note on this species from the above material. In the National Museum collection was an old specimen from Moscow, Idaho, labeled under the manuscript name fragariae by E. A. Schwarz, and this name has been retained for the species. Recently the species has been reported as damaging strawberry plants in Washington, and adults have been submitted for identification by William W. Baker. From all the records available it seems that this species is restricted in its larval habits to strawberry, but it probably also infests some closely allied wild plant.

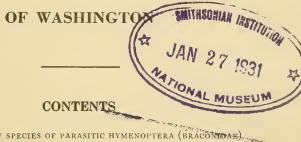
Actual date of publication, December 19, 1930

IN FLORIDA . .

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY



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No. 9

EUPHYLLURA ARCTOSTAPHYLI SCHWARZ AND EUPHYLLURA NEVEIPENNIS (SCHWARZ) (HOMOPTERA: CHERMIDAE).

A DIFFERENCE IN INTERPRETATION.

By F. D. Klyver, San Mateo Junior College, San Mateo, California.

The genus Euphyllura is represented in North America by four known species. One of these, E. arbuti Schwarz, occurs on madrone, Arbutus menziesii Pursh. apparently throughout the range of its host (1, 2, 4, 8). Another species, E. arbuticola Crawford, which is very closely related to the first named species, occurs on Arbutus arizonica Sargent in Arizona. Available records (1, 2, 8) indicate that it likewise is found ubiquitously with its host. A third species, E. arctostaphyli Schwarz, has been frequently taken from Arctostaphylos pungens H. B. K. (1, 8) and from various other species of manzanita (2) chiefly in California but also as far northward as Washington and eastward in Wyoming (1), Colorado and Arizona (1, 2, 8). The fourth representative of the genus, *E. neveipennis* (Schwarz) has hitherto been considered a variety of E. arctostaphyli Schwarz (1, 2, 8). However, it differs significantly from this species in many important characters and should, for the reasons stated below, be considered as a separate species. Following the original description of E. arctostaphyli, Schwarz (8) says with reference to this supposed variety, "a remarkable variety occurs in California which may be readily mistaken for a different species and which, for this reason, deserves especial mention and a distinct varietal name." Contrary to this opinion, the danger apparently lies not in mistaking it for a different species, but in failure to recognize it as being of specific rank. This is evident from an interpretation and diagnosis by the methods here described.

SPECIMENS.

Numerous specimens of *E. arctostaphyli* Schwarz, including both adults and nymphs, are at hand for study from Placerville, Eldorado County, Tesla, Alameda County, Clark's Canyon, San Mateo County, Black Mountain, Stanford University,

Santa Clara County, Mount Hamilton, Santa Clara County, Pine Ridge, Fresno County, Coalinga, Fresno County, General Grant National Park, Tulare County, and Julian, San Diego County, all of which are California localities. Adult specimens of *E. neveipennis* (Schwarz) are available from "Deer Creek Inn," Placerville-Lake Tahoe road, Eldorado County, and from West Point, Calaveras County.

METHODS.

The general method employed in the study of the Chermidae has been fully described elsewhere (3, 4, 5, 6, 7). In the study of the adults it consists of making several different kinds of mounts. Where the material is limited all available specimens are cleared in caustic potash, dehydrated in 95% alcohol, stained in magenta, cleared in carbol-xylene, and mounted in balsam on slides, the wings being merely cleared in carbolxylene and then mounted in balsam under a separate coverglass, together with the head, on the same slide with the rest of the body. When the material is more abundant separate mounts of entire specimens are made in dry cells on ordinary slides. In these cells the specimen is oriented in various ways to best expose the lateral, dorsal, or ventral aspects as may be desired and is then fixed in position with white shellac. Also, where long series of specimens are at hand, mounts of corresponding structures from different specimens, the fore wings for instance, are mounted separately for variational studies.

The essential purpose to be served by whatever technique is employed is the preparation of the specimen for complete and exhaustive study. In certain cases where it seems advisable, this means preparation for study with the greatest magnifications obtainable with the compound microscope. An instance of this kind is found below in the comparative study which was made of the wing membranes of the two species

here under consideration.

EUPHYLLURA Forster.

The three species of this genus before me agree in all particulars save one with the generic characters as given by Crawford (1). This one exception pertains to the antennae. Crawford describes the antennae as being short and "thick." Proportionate to the size of the insect in each case of the species represented in my collection, the antennae are about as long as the width of the head and are, therefore, properly considered comparatively short. On the other hand, the first and second antennal segments of each of the species here considered are relatively thick (about .1 mm. and .08 mm. respectively in *E. arctostaphyli*, for instance), and all the other antennal segments

are comparatively very small in diameter (about .02 mm.) as compared with a total length of the antennae of .8-.9 mm. in the same species.

DESCRIPTION OF PRINCIPAL DIAGNOSTIC CHARACTERS. Euphyllura arctostaphyli Schwarz.

Length to tip of folded wing 3.2-3.7 mm., length of fore wing 2.0-2.6 mm., length of body mounted on slide 3.3-3.7 mm., width of fore wing .9-1.2 mm., width of head .8-1.0 mm., length of antennae .8-.9 mm. General color throughout reddish brown with lighter markings on the head, thorax, and fore wings, the latter frequently being present as transverse bands (Plate 9, figs 6 and 7). Characters of the genus well developed.

Head slightly broader than thorax, strongly deflexed, irregularly wrinkled or corrugated, sometimes very strongly so (Plate 9, fig. 2), pubescent with many small setae uniformly distributed over the general surface; genae about a third as long as vertex, rectangular in shape, forming a uniformly smooth surface with and scarcely separable from the vertex; antennae ten-segmented, slender, as long as or very slightly shorter than width of head, the first and second segments more than three times the diameter of the other segments, segments 4, 6, 8, and 9 having moderately conspicuous sensoria.

Thorax strongly arched, the general surface covered with numerous closely set, rounded, and variously shaped, small chitinized plates, pubescent with small setae distributed over the entire surface. Legs comparatively stout, the femur of the hind and middle pair of legs having a double or single row of setae and three sensoria each on the mesal side, the femur of the anterior pair having a less well defined row of such setae and but a single sensorium; the posterior tibia without a spur at the base, with seven or eight small black teeth at the apex, and two small black claws on the posterior tarsus. Fore wings slightly more than twice as long as broad, rhomboidal, coriaceous in texture, opaque, and variable in color (Plate 9, figs 6, 7, and 9), the membrane being covered with small ovulate chitinized plates of considerable thickness, each one of which apparently has at its apex a very minute seta set in a relatively large and conspicuous socket, the general surface of the membrane bearing sparsely distributed and relatively large setae, the venation as illustrated by Crawford (1) and by Schwarz (8), the veins beset biseriately with relatively large setae and generally obscured by the chitinization. Hind wings relatively large, fumate, with the venation as illustrated (Plate 9, fig. 8), the veins being a darker brown than the membrane and rather thick at the proximal end but becoming obscure apically, the membrane delicately membraneous in the apical region, the anterio-proximal margin bearing a row of stout setae, the basal vein (R-M-Cu) and about half of the radius bearing setae, the wing membrane beset with numerous minute points.

Abdomen with the tergites and sternites equally and moderately to strongly chitinized, the tergites bearing a singly row of hair-like setae along the posterior margin, the sternites having several rows of such setae located chiefly toward the posterior margin. Male genitalia relatively large, the proctiger or anal valve distinctly longer than the claspers, elongate-oval in lateral aspect, the

anterior portion heavily chitinized, the posterior margin membraneous and frequently shrunken or completely collapsed in dried or mounted specimens; the claspers wide at the base, abruptly constricting in the proximal third, then gradually widening to become roundly spatulate in the distal half, the outer surface bearing a number of fine sparsely scattered setae, the inner face covered with numerous very closely set short, stout, downwardly pointing setae (Plate 9, figs. 13 and 14). Female genital segment (Plate 9, fig. 11) about two-thirds of the length of the rest of the abdomen, heavily chitinized, the dorsal valve conspicuously longer than the ventral valve, the dorsal valve bearing scattered posteriorly pointing setae over the general surface, and on the apical third bearing many short, stout dorsally, anteriorly, and ventrally pointing setae, the apex bluntly rounded; ventral valve sharply pointed apically, with scattered setae over the general surface, the setae being more numerous and crowded toward the apex.

Euphyllura neveipennis (Schwarz).

Length to tip of folded wing 4.0-4.1 mm., length of fore wing 3.1-3.4 mm., length of body mounted on slide 4.1-4.5 mm., width of fore wing 1.5-1.6 mm., width of head 1.1-1.3 mm., length of antennae 1.1-1.3 mm. General color very light brown with pinkish, reddish, and light to deep chocolate brown markings, vertex and genae cream-white, the margins of the head, the eyes, the first two and the last antennal segments dark brown, the thorax with four conspicuous and constant dorsal and longitudinal chocolate brown strips, the wings white with very small blood-red marginal spots, abdomen light reddish brown color with the genital segments generally darker. The characters of the genus well developed.

Head slightly wider than width of thorax, strongly deflexed, the general surface covered by weakly chitinized plates (Plate 9, fig. 4), pubescent with small setae uniformly distributed over the entire surface but becoming larger toward the ends of the genae, the genae about one half as long as the vertex with which they form a uniformly smooth surface and from which they are, therefore, scarcely separable, the ends of the genae broadly rounded and slightly bulging laterad; antennae ten-segmented, slender, as long as width of head, the first and second antennal segments more than three times the diameter of the other segments, segments 4, 6, 8, and 9 having moderately conspicuous sensoria.

Thorax strongly arched, the general surface covered with numerous variously shaped strongly chitinized and closely set plates, pubescent with small setae scattered over the general surface. Legs rather stout, the femur of the hind and middle pair of legs with a double or triple row of setae and three sensoria on the mesal side, the front pair of legs without setae in such definite rows and with but a single sensorium; base of posterior tibia without a spur, apex of the posterior tibia with nine or ten small black teeth, the posterior tarsus with two small black claws. Fore wings slightly more than twice as long as broad, rhomboidal but rather broadly rounded at the apex, very slightly coriaceous in texture, semi-transparent and uniformly white except for occasional and irregularly spaced, small blood-red marginal spots, the wing membrane densely pebbled with very small, weakly chitinized plates (Plate 9, fig. 8), venation similar to and not as

obscure as that of *E. arctostaphyli* Schwarz, the veins beset biseriately with small setae, the membrane bearing setae around the entire margin and sparingly on the wing membrane at the proximal end. Hind wing similar to that of *E. arctostaphyli* Schwarz in size and shape, pure white and very delicately membraneous, the venation discernible only toward the proximal end where the veins are feebly developed as ridges, the membrane beset throughout with numerous exceedingly minute points.

Abdomen with the plates only moderately chitinized, the tergites with a single row of small setae along the posterior margin, the sternites with similar setae scattered chiefly over their posterior half. Male genitalia large, the proctiger distinctly longer than the claspers, elongate-oval in lateral view, the anterior portion heavily chitinized and the posterior margin membraneous, the claspers peculiarly "slipper-shaped" in lateral aspect as illustrated (Plate 9, figs. 16 and 17), the outer surface bearing relatively few scattered setae, the inner surface being densely beset with setae of two distinct sizes distributed as shown (Plate 9, fig. 17). Female genital segment similar to that of *E. arctosta-phyli* Schwarz (Plate 9, fig. 11) except that the dorsal valve is only very slightly longer than the ventral valve, and except for the type and distribution of the setae, those of this species all being of the same type and being densely and uniformly distributed over the entire genital segment, becoming more densely crowded toward the apex.

TAXONOMIC CONSIDERATIONS.

Schwarz (8) and later Crawford (1) have both considered E. neveipennis (Schwarz) a variety of E. arctostaphyli Schwarz and in so doing have each apparently based their interpretations on the superficial resemblances between these two closely related species. Schwarz has described with painstaking care the color variations found in each of the species and evidently considers the color pattern as being of some importance. He has also noted some differences in the general appearance of the fore wing venation. The sexual characters, on the other hand, are given scant attention by him. Crawford has similarly dealt chiefly with the same characters emphasized by Schwarz, although he notices some differences in the claspers or forceps of the male genitalia, but, as it happened, either he has failed to see them correctly or else he has misinterpreted certain essential characters of the genitalia. Furthermore, Crawford had made no mention of the significant differences between the female genitalia of the two species, and also has made no note of the differences present in other less important characters.

The writer has on several occasions (5, 6, 7) stated his opinion as to the relative taxonomic value of color pattern and the sexual characters in the Chermidae. In rare and isolated cases only is coloration and color pattern of taxonomic importance. Conversely, in exceedingly rare cases are the sexual characters without great significance. The writer has also called attention

to the importance of wing structure (5, 7) totally aside from the type of wing venation present in individual cases.

The principal characters on the basis of which *E. neveipennis* (Schwarz) is here distinguished as a separate and distinct species instead of a variety of *E. arctostaphyli* Schwarz are obvious when

revealed by the technique here employed.

First in significance and importance are the distinctive differences of both the male and the female genitalia. In the males, the claspers differ both in form and in the type of setae present and in the distribution of the setae, these setae entirely covering the inner face of the clasper in both species instead of merely forming a "fringe of hairs" as stated by Crawford (1). The genitalia of the females are superficially alike in size and general proportions although the difference in the relative lengths of the dorsal and ventral valves in the two species would ordinarily be considered significant. Aside from this, the difference in the type and distribution of the setae is regarded as very important, E. neveipennis having only one type of setae all of which are directed posteriorly, whereas E. arctostaphyli has two distinct types of setae, the longer hair-like type merely constituting the general pubescence of the genitalia while the smaller, stouter setae, judging from their form and the directions in which they point, are obviously structures of special function, which are possibly of importance in mating. The second most important basis for a separation of these two species is found in the structure of the fore wing and to a less extent the hind wing of each species. In E. neveipennis what has been described by Schwarz (8) and Crawford (1) respectively as a "fine white powder" and a "rather white-pulverulence" is in reality numerous very small colorless chitinized plates scattered densely over the entire wing membrane (Plate 9, fig. 8). Contrasted with this in the wing of E. arctostaphyli the fore wing membrane bears numerous much larger chitinized plates of rather unusual structure, (Plate 9, figs. 9 and 10). This contrast in structure is very apparent in Figures 8 and 9, these illustrations being drawn to exactly the same scale with the camera lucida. Incidentally, the hind wings also differ in important details as stated above. The third most important basis of distinction between these two species is found in the differences in size and relative proportions. This is evident from the measurements recorded above and is equally apparent from comparisons of Figures 1 and 2, and Figure 14 with Figures 16 and 17, all of which are drawn accurately to the same scale.

Other noteworthy differences of less significance than those stated above are found in the somewhat different form of the heads (Plate 9, figs. 1 and 3), in the difference in the sculpturing of the heads (Plate 9, figs. 2 and 4), in the differences in the setae on the femurs, in the difference in the number of teeth on

the apex of the posterior tibiae, and in the different degree of chitinization of the abdominal plates.

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EXPLANATION OF PLATE.

(Drawn with camera lucida by the author.)

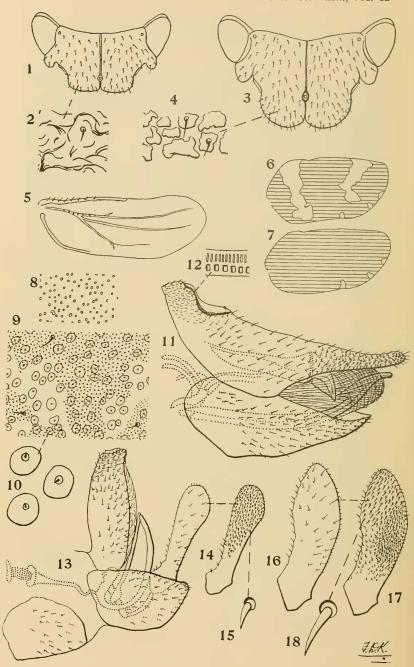
All drawings of the corresponding structures are made to the same scale and are therefore comparable.

Euphyllura arctostaphyli Schwarz.

1. Cephalic view of head; 2, rugose surface of genae; 5, hind wing; 6 and 7, fore wings, diagrams illustrating the degree of contrast in wing coloration, shaded area reddish brown, unshaded areas white or nearly white; 9, detail of membrane of fore wing magnified about 500x, brown pigmentation shown by stipple, circles each representing a chitinous scale with a minute setae at its apex; 10, detail of chitinous scales magnified about 1200x; 11, genital segment of female; 12, detail of circum-anal ring of pores; 13, genital segment of male; 14, inner face of clasper showing distribution of setae; 15, seta greatly magnified.

E. neveipennis (Schwarz).

3. Cephalic view of head; 4, chitinous plate-like sculpturing of genae; 8, detail of membrane of fore wing magnified about 500x; 16, outer aspect of clasper of male; 17, inner face of clasper; 18, seta greatly magnified.



A NEW SPINNING MITE ATTACKING ASPARAGUS PLUMOSUS IN FLORIDA

By E. A. McGregor,

Of the Bureau of Entomology, United States Department of Agriculture.

In the course of their duties at the Federal laboratory at Orlando, Florida, Mr. W. W. Yothers and Mr. C. B. Keck observed a mite causing serious damage to the ornamental plant Asparagus plumosus. During the seasons of 1928 and 1929, these entomologists sent to the present writer specimens of the Asparagus mite and a description of the appearance and work of the pest in the field. Critical study has established that the mite is new to science, and its characters are such that it can hardly be placed in any known genus. Consequently the following new genus is created to receive the present new species:

DIVARINYCHUS, new genus.

This genus is thus far represented by a single species from Florida.

Spinning mites with empodial claw very deeply split into two equal, strong, divaricate, sickle-shaped fang-like prongs, each prong bearing dorsally two exceedingly fine hair-like spurs which hardly equal in length that of the prongs. Collar trachea extending downward first as a rather straight narrow tube, then bending at an angle of about 155°, increasing gradually in caliber to form enlarged distal portion. Penis with basilar lobe absent from usual position; with corresponding lobe ventrally opposite usual position of basilar lobe; bearing distally a sharp-pointed barb.

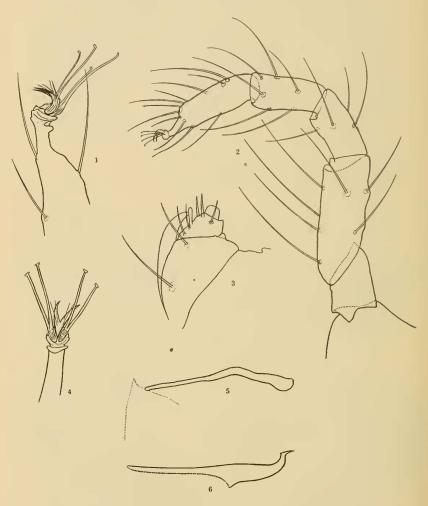
Type.—Divarinychus floridensis McGregor.

Divarinychus floridensis, new species.

Female.—General body color salmon pink, varying to greenish-yellow in certain old individuals; dark colored blotches laterally, probably due to dark material contained in internal organs; legs and palpi same color as body. Eyes carmine, directly above coxae II. Body oval, widest across hind margin of cephalothorax, in length about 0.41 mm. Body setae conspicuous. "Thumb" of palpus thicker than long, bearing at its tip a "finger" which is thicker than long, and the base of which is only about one-fourth less thick than that of the "thumb" at tip; the dorsal "finger" or sensilla is at least half again the length of the terminal "finger"; the customary pair of digituli arise from the dorso-distal angle; a short hair arises laterally near the tip of the "thumb," and a pair of hairs arise dorsally between the dorsal sensilla and the base of the "thumb"; the claw of the penultimate joint reaches to the dorsal "finger." Legs a trifle shorter than usual, quite hairy; femur 2 1-5 times as long as thick, barely exceeding the tarsus; tibia barely exceeding the patella, which is about one-half again as long as the trochanter: Relative lengths of the joints of foreleg as

Explanation of Figures. Divaring thus floridensis McGregor.

Fig. 1, tarsal appendages in profile; Fig. 2, foreleg viewed laterally; Fig. 3, palpus (9) and its appendages, viewed laterally; Fig. 4, tarsal appendages viewed from above; Fig. 5, collar trachea; Fig. 6, penis, viewed laterally.



follows: Trochanter, 14; femur, 33; patella, 20; tibia, 22; tarsus, 32. Tip of tarsus (female) with an empodial claw which is split almost to its base into two equal strong, divaricate, sickle-shaped prongs; each of these divisions bears dorsally two exceedingly fine hair-like spurs which hardly equal in length that of

the prongs. The usual series of four tenent hairs arise from the onychium at the sides of the empodial claw base. Collar trachea extending downward first as a rather straight narrow tube, then bending backward at an angle of about 155°, increasing gradually in caliber to form the enlarged distal portion. Egg salmon pink, spherical, without markings.

Male.—General body color salmon pink; irregular dark blotches laterally. Legs same color as body; front legs longer than other three pairs. Body cuneate-oval, widest across hind margin of cephalothorax, in length about 0.26 mm. Eyes dark carmine. Penis with inner lobe rod-like, about twice as long as shaft; basilar lobe absent from its usual position, but with a corresponding lobe situated ventrally at a point opposite the usual position of the basilar lobe; shaft proximally about three times as thick as inner lobe and tapering distally; hook bent upward at nearly right angles to shaft, and in turn deflected distally to form a sharp-pointed barb.

Type slide.—Cat. No. 1004, U. S. N. M.

The type material is from Longwood, Florida, February 8, 1928, from Asparagus plumosus, collected by C. B. Keck. The same species has been received from the same host from Orlando, Florida. Mr. W. W. Yothers of Orlando has always maintained that this mite is distinct from other red spiders occurring in Florida. Messrs. Yothers and Keck write that, so far as they know, "this species has not been taken on any plant other than Asparagus plumosus, but it probably occurs on many other plants." The injury to the Asparagus "fern" occurs chiefly to the more tender growth and young shoots, and where the infestation is heavy the color of the plant is changed from green to whitish.

TWO NEW SPECIES OF PARASITIC HYMENOPTERA (BRACONIDAE) FROM OHIO.

By F. DEGANT.

SUBFAMILY ROGADINAE.

Rogas granulata, new species.

This species can be separated from most of those already described, by its more slender habitus. Its entire body including palpi and legs, except the parts specified below, is granular. The pronotum is also less declivous anteriorly than usual, giving the thorax an appearance quite different from that so characteristic of *R. parasiticus* Norton, *R. terminalis* Cresson, and *R. abdominalis* Cresson. In habitus as well as in having the 4th tergite strongly striated this species resembles *R. aciculatus* Cresson but is at once distinguished by its dark markings.

Female.—Length 4.5 mm.; anterior wing 4 mm. Antennae 47 jointed, the joints all two or more times as long as thick. Head transverse and clothed with scattered hairs; posterior orbits about one-half the transverse diameter of

the eyes; malar space as long as two-thirds the height of the eyes; eyes elliptical and of medium size; clypeus small, separated from the face, convex, the foramina distinct. Ocelli small, the ocell-ocular line about equal in length to the postocellar line and about one-half the length of the ocell-occipital line. The hypostomal carinae sharply defined and much higher than the occipital carina. The face below the antennae for one-half the distance to clypeus transversely striated, the continuity of the striae broken by a short median carina. Pronotum not declining sharply anteriorly; propleuron obliquely rugose below; mesonotal lobes not prominent, the notauli weakly defined and ending in a finely longitudinally striated area in front of the scutellum; an area below the anterior wings rugose. Propodeum rather long and nearly flat to its apical third where it becomes sharply declivous; median carina distinct. The first four segments of abdomen striate, the median carina ending at apex of the third tergite, all segments beyond the fourth retracted. The second abcissa of radius twice as long as the first; the width of the second cubital cell equal to two-thirds its length; the second abcissa of cubitus, the first transverse cubitus, and the recurrent vein subequal in length; that portion of the first abcissa of discoidal vein between the basal vein and the nervulus one-half the length of nervulus; sub-mediellan cell half as long as the mediellan. Thorax beyond a line drawn from the apex of postscutellum to the posterior edge of the procoxal fossae, the middle and hind coxae, the propodeum except a basal spot on each side, first and second abdominal tergites entirely, basal three-fourths of third tergite, and a plano-convex area across the base of the fourth tergite, reddish testaceous. All trochanters, femora and tibiae at their bases, and proximal four joints of tarsi, slightly paler testaceous; balance of body and legs deep black; wings hyaline, veins and stigma brownish black, the stigma with a pale spot at base. Antennae fusco-testaceous. Palpi blackish.

Mag.-42 x 102x.

Type-locality.—Cleveland, Ohio.

Type.—Cat. No. 43176, U. S. National Museum.

Described from one female taken on cabbage infested with *Autographa brassicae*, July 14, 1930.

SUBFAMILY MACROCENTRINAE.

Macrocentrus harrisi, new species.

This species in color is somewhat like *M. pyraustae* Viereck and *M. longicornis* Provancher but can be separated from both of them by the long ovipositor, the shape of the eyes and the color of the dorsum of abdomen.

Female.—Length 4.5 mm.; exserted portion of ovipositor 8 mm.; anterior wing 4 mm. Head viewed from above transverse; viewed from in front about as broad as high, narrowed below, the vertex raised above the level of eyes. Whole head smooth and shining, the face below antennae with a few weak setigerous punctures. Clypeus convex and clothed with a few long hairs. Eyes ovate. The malar space nearly one half the length of the eyes.

Antennae with about 45 joints; the first joint of flagellum one and one-half

times as long as the second, about six or seven times as long as thick; apical joints about twice as long as thick. Ocelli small, the distance between the lateral ocelli about equal to the distance from lateral ocellus to median ocellus; ocellocular line one and one half times the postocellar line. Scutum and scutellum mostly polished and impunctate; notauli distinct, punctate and ending in a punctate depression at middle of mesoscutum. Scutellar groove shallow, crenulate. Mesopleuron polished, the sternaulus wide and rather weakly punctate. Propodeum rugose, the lateral carinae slightly defined at apex. Metapleuron more coarsely sculptured on posterior half than anteriorly. Hind basitarsus equal to, or greater in length, than the following joints combined. First abdominal tergite with median depression at base, the distance between its spiracles equal to the distance from spiracle to base of tergite. First three tergites aciculate-striate, the following tergites very faintly shagreened. Radial vein arising a little beyond middle of stigma, its first abscissa a little less than half the length of second.

Color black. Scape, pedicel, base of mandibles, palpi, legs including all coxae, and the first three sternites of abdomen stramineous; hind tibiae and all tarsi fuscous. Wings hyaline, the veins brownish black; stigma nearly uniformly black but with a small area at base indistinctly paler.

Mag.--34 x 102x.

Type-locality.—Bedford, Ohio.

Type.—Cat. No. 43170, U. S. National Museum.

Described from two females, type and one paratype, collected by the writer at Bedford, Ohio, June 27, 1930.

The species is named for Mr. Joseph Porter Harris of Cleve-

land, Ohio, an advocate of this science.

Many thanks are due Mr. A. B. Gahan, U. S. Bureau of Entomology, for his criticism of the manuscript.

CONCERNING SOME TINGITIDAE FROM THE PHILIPPINES (HEMIPTERA), WITH NEW SPECIES.

By CARL J. DRAKE, Ames, Iowa.

This paper contains notes on nine species of Tingitidae from the Philippine Islands, three of which are described below as new. I am indebted to the late Dr. C. F. Baker of the Philippine Islands and to the United States National Museum for the privilege of studying the specimens.

Paracopium philippinensis, n. sp.

Dark fuscous-brown, the paranota and costal area of elytra brownish testaceous with transverse nervelets mostly fuscous-brown. Antennae rather long, moderately stout; segment I slightly thicker and a little longer than II; III slightly swollen towards apex, the short golden hairs closely appressed and not very distinct; IV moderately swollen, clothed with much longer, more slender,

and much more prominent hairs; proportions, 12: 9: 64: 34. Rostrum extending a little beyond anterior coxae; rostral channel open behind. Bucculae closed in front, more or less brownish testaceous. Head fuscous-brown; posterior spines short, yellowish, directed forward, contiguous with head, extended a little beyond posterior margins of eyes; median spine greatly reduced or entirely wanting; anterior pair stout, short, conical, directed inwardly, their tips frequently touching.

Pronotum coarsely pitted, strongly swollen, tricarinate; lateral carinae slightly curved, constricted a little behind the humeri; collum very distinct, reticulate, a little lighter in color, slightly emarginate in front. Paranota very narrow, composed of a single row of small areolae. Wings clouded, considerably longer than abdomen. Elytra with areas distinctly marked off; costal area moderately wide, uniseriate, the areolae hyaline; subcostal area mostly biseriate, some places triseriate; discoidal area bounded by a prominent costate nervure, the outer margin nearly straight, narrowed at both base and apex with four areolae at widest part; sutural area with areolae considerably clouded with fuscous. Legs very dark fuscous-brown.

Length, 3.83 mm.; width, 1.17 mm.

Holotype (male) and allotype (female) Island Sibuyan, Philippine Islands, Baker collection, U. S. N. M., Washington, D. C. Paratypes (four specimens), taken with type, in collections of U. S. N. M. and writer. This species is probably most closely allied to P. lewisi Distant from which it differs in proportional lengths of the antennal segments.

Serenthia vicinalis Drake.

Female, Mt. Maquiling, Luzon, Philippine Islands, Baker collection.

Cromerus bakeri, n. sp.

Slightly larger than *C. kalshoveni* Drake but differing in having shorter antennae, slightly less tumid pronotum, very differently formed lateral margins of anterior lobe of pronotum, and distinct lateral carinae on posterior portion of pronotum. Head short, black, with golden scalelike pubescence on the median portion. Posterior spines appressed, directed anteriorly, extending to the middle of eyes. Rostrum extending to intermediate coxae. Antennae moderately slender, shortly pilose, ferrugineous brown, the apical and first two segments a little darker; proportions, 12: 9: 56: 35.

Body ferrugineous brown, somewhat shiny, clothed with scale-like, golden, decumbent pubescence. Pronotum strongly swollen, very shiny, coarsely pitted, narrowed anteriorly; median carina very prominent, the lateral short, slightly divaricating, extending from tumid elevation to posterior margin. Collum very prominent, strongly raised, jointly raised along the median line with median carina, with a row of rather large cells along the anterior margin. Calli very strongly depressed, black. Pronotum with a large, thick, round, carinalike structure on each side of anterior lobe connecting the lateral margin

with collum, the carina forming two large opaque cells on each side. Elytra rather dull, a little longer than abdomen, jointly rounded behind; nervures of discoidal area dark fuscous, the areolae opaque; costal area narrow, uniseriate, the areolae a little larger and lighter in color at widest part; subcostal area biseriate; discoidal area narrowed at both base and apex, widest near middle, outer margin slightly curved, areolae not arranged in very regular rows. Wings a little longer than abdomen, smoky. Legs moderately long, dark ferrugineous brown.

Length, 4.68 mm.; width, 1.68 mm.

Holotype, female, Island Samar, Philippine Islands, collected by C. F. Baker, in writer's collection. The antero-lateral margin of the pronotum separate this species at once from the known species of *Cromerus* Distant.

Cromerus kalshoveni Drake.

Female, Butuan, Mindanao Islands, Philippine Islands, Baker collection. This species has been recorded heretofore only from Kediri, Java, collected by L. Kalshoveni, on *Vitex heterophylla* Roxb.

Cromerus invarius (Walker).

Fifty-five specimens, Butuan, Mindanao Island and Island Samar, Philippine Islands, collected by C. F. Baker, U. S. N. M. Up to the present time, this species has been recorded only from the type locality, New Guinea. Mr. W. E. China, who has kindly compared a female of the above series with Walker's type in the British Museum of Natural History, London, states, "Very closely allied to if not identical with *C. invarius* Walk. and differing only in slightly smaller size and in rather shorter and more robust fourth antennal segment." As the long series of specimens shows a little variation in size and length of the last antennal segment, it seems advisable to identify the Philippine specimens as *invarius*. The male genital structures of the species of Cromerus should be studied.

C. invarius Walker has a much longer body and also longer antennae than kalshoveni Drake or the new species described below. The fourth antennal segment of invarius is also considerably longer; the scalelike, golden, decumbent pubescence of

the antennae is very short and not very conspicuous.

Diplocysta nubilia Drake.

Singapore, Straits Settlements (six specimens), and Cuernos Mts., Negros, Philippine Islands (one specimen), Baker Collection. The Singapore specimens are from the type locality and were probably collected with the type (female).

Cysteochila pictus (Distant).

Female, Sandakan, Borneo; female, Mt. Maquiling, Luzon, Phillipine Islands, Baker collection.

Stephanitis quercus Bergroth.

Baguio, Benguer, Philippine Islands (two specimens), Baker collection.

Tingis buddleiae, n. sp.

Elongate-ovate, brownish testaceous, frequently with whitish exudations on head, pronotum, and to a more limited extent on reticulations, clothed with long, fine, somewhat decumbent hairs, those along the lateral margins of paranota and elytra longer, bristly and almost spinelike. Head covered with whitish exudation, adorned with five long erect spines, the anterior pair converging. Rostrum reaching between posterior coxae; intermediate and posterior legs rather widely separated. Bucculae almost contiguous in front. Antennae moderately long, stout, widely separated at base, brownish, beset with long setae; segments I and II considerably swollen, the latter shorter and slenderer; III tapering a little towards apex, two and a half times as long as IV; proportions, 7: 5: 34: 14. Legs moderately stout, brown, the tarsi darker.

Pronotum brown, closely and rather finely pitted, slightly swollen through disc, tricarinate; each carina composed of one row of very small areolae; lateral carinae converging posteriorly; median carina raised anteriorly, forming a small rooflike hood, the anterior margin almost truncate. Paranota rather broad, slightly reflexed, the outer margin jointly rounded with both anterior and posterior margins, projecting a little anteriorly beyond pronotum, triseriate in front, biseriate at humeri. Elytra broad, slightly narrowed posteriorly; costal area broad, triseriate, the areolae fairly large and arranged in regular rows; subcostal area biseriate, the areolae distinctly smaller; discoidal area finely reticulated, slightly impressed, bounded by a prominent vein, with five or six rows of cells at its widest place, narrowed at both base and apex.

Length, 3.51 mm.; width, 1.59 mm.

Holotype (male), allotype (female), and one paratype (male), Los Banos, Philippine Islands, Baker collection, U. S. N. M. Paratype, female, Mt. Makling, Luzon, writer's collection. This species was collected on Buddleia asiatica Lour.

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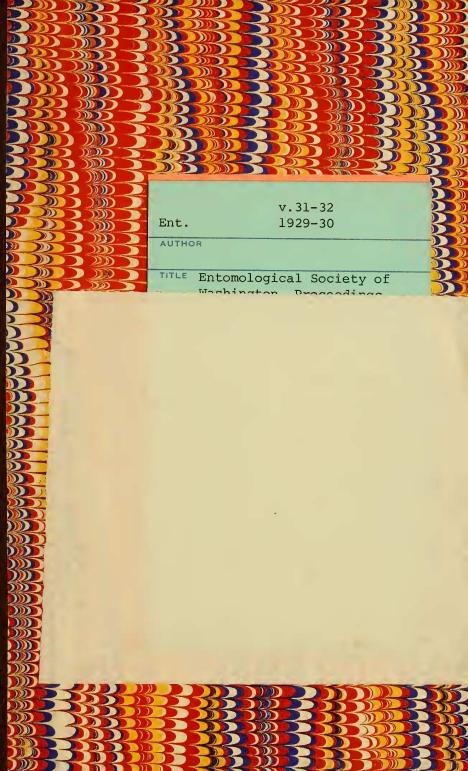












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